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Contents

91 Villard de Honnecourt, Archimedes, and Chartres ROBERT BRANNER

97 Michelangelo and the Porta Pia ELISABETH B. MAC DOUGALL

109 Architectural Currents on the Mississippi River Frontier: Nauvoo, Illinois ROBERT M. LILLIBRIDGE

115 American Notes
Latrobe on Architect's Fees, 1798
Early Brass-cased Rim Locks ROBERT T. TRUMP
Ammi B. Young in the Connecticut Valley OSMUND R. OVERBY
The Hoo Hoo House JAMES F. O'GORMAN

125 Books
Henry-Russell Hitchcock, *Architecture: Nineteenth and Twentieth Centuries*, reviewed by EDUARD F. SEKLER
Gilbert Herbert, *The Synthetic Vision of Walter Gropius*, reviewed by WILLIAM SENER RUSK
Christopher Hussey, *English Country Houses: Late Georgian, 1800–1840*, reviewed by ALAN GOWANS
Frank Lloyd Wright, Drawings for a Living Architecture, reviewed by H. R. HITCHCOCK
S. G. Gillam, *The Building Accounts of the Radcliffe Camera*, reviewed by JANE LANG

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Villard de Honnecourt, Archimedes, and Chartres

ROBERT BRANNER Columbia University

THE techniques of Gothic masonry construction can best be studied in two ways. The monuments themselves unquestionably provide the best evidence of the procedures that were actually employed, although accurate measured drawings, the sine qua non of this approach, are difficult and costly to make, and they fail to reveal anything beneath the surface of a building, precisely where masons' setting-out marks are most likely to be concealed. One cannot wish that more Gothic churches will be destroyed so historians of architecture may prowl among the ruins, looking for indications as to how they were erected. The second approach comprises the study of the rare texts and documents that have been preserved from the Middle Ages. Foremost among these is the manual of the thirteenth-century Picard architect, Villard de Honnecourt, which contains a set of diagrams of masonry techniques drawn and annotated by an anonymous follower known as Master 2, about 1250.[1] These diagrams sometimes seem very hypothetical, however, and many still hold secrets for the modern reader. Three in particular—the keystones *del tiirc* and *del quint point*, and the so-called Archimedes spiral (p. 40 *c*–2, *d*, *e* in fig. 8)—have never been satisfactorily explained. The last one has the dubious honor of being the single diagram Master 2 did not annotate, but by extraordinary good fortune, similar spirals have been preserved on the bed-face of a capital from Chartres Cathedral.[2] It is therefore possible to compare the manuscript figure with one that seems actually to have been employed in the construction of a Gothic monument.

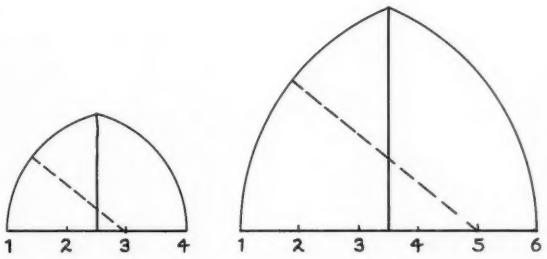

Fig. 1. Traditional third- and fifth-point arches, numbered according to Brutails.

The absence of a caption in p. 40 *e* is perhaps understandable, since this figure forms an integral step in the procedure of setting out the keystones in the two preceding diagrams. In order to understand the procedure, however, it would seem necessary to revise the terminology for the various forms of Gothic pointed arches that has been current since the Renaissance. Master 2 wrote *clef del quint point* and *del tiirc*, and every modern student of the manuscript has correctly associated these phrases with the keystones of the *quint-point* and *tiers-point* arches. By the traditional definition, one form of the third-point arch is generated from a base divided into three equal units, the centers of the curves being situated one unit in from the ends, while the fifth-point arch has five equal units in the base and the centers are situated one unit in (fig. 1).[3]

1. Paris, Bibl. Nat., fr. 19,093. The standard edition is H. R. Hahnloser, *Villard de Honnecourt* (Vienna, 1935), with bibliography (the page and figure numbering used in the present article follows this edition); see also J. B. A. Lassus, *Album de Villard de Honnecourt*, A. Darcel (ed.) (Paris, 1858); R. Willis, *Facsimile of the Sketchbook of Wilars de Honnecourt* (London, 1859); and *The Sketchbook of Villard de Honnecourt*, Th. Bowie (ed.) (Bloomington, 1959), with pages renumbered.

2. I am indebted to Dr. Peter Kidson, Conway Librarian at the Courtauld Institute of Art, for bringing the piece to my attention and for providing the photograph reproduced in fig. 5.

3. The other third-point form is generated around an equilateral triangle; see Hahnloser, p. 115, *et al.* The traditional definitions seem to derive from Italy: cf. Scamozzi, *Dell'Idea . . .*, III, xiv; Philibert de l'Orme, *Nouvelles Inventions . . .*, XV, and Wotton, *The Elements of Architecture* (London, 1624), p. 51, seem to make this clear; *quinto acuto* was used in this way by Giovanni di Gherardo da Cremona, see H. Saalman, *Journal of the Society of Architectural Historians* XVIII (1959), 11–20.

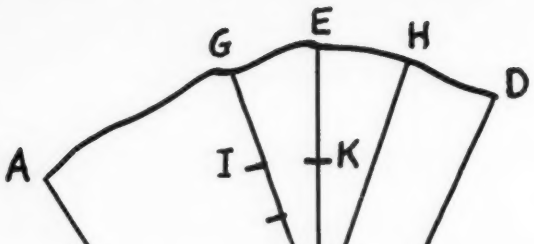

Fig. 2. Third-point keystone, redrawn from p. 40 *c*-2.

If the arches are constructed from such bases, however, the keystones do not correspond to those in the diagrams, and as Master 2 is not noted for his intelligence or accuracy, it has generally been assumed that the drawings are incorrect or badly proportioned.[4] If, on the other hand, the diagrams and captions are accepted as they stand, it is clear that our own terminology is at fault. This may be confirmed by the coherence, simplicity, and mathematical foundation of the procedure outlined in the diagrams.

The keystone resembles an ordinary voussoir with a small, triangular section added to carry the extrados up to the peak of the arch (fig. 2).[5] Prior calculations, perhaps found among the other diagrams of Master 2, have undoubtedly provided the upper and lower curves, as well as the thickness of the arch, and serve as a point of departure for setting out the keystone.[6] AB, GF, HF, and DC represent the radii of the arch, EF the vertical axis and GEF or GHF the area to be added. In the third-point design, any three equal units are marked off on the radius passing through the peak of the soffit (FI) and another unit of the same size (IK) is laid out perpendicular to the vertical axis, forming a triangle with sides of 3, 1, $2\sqrt{2}$. But the length and position of the vertical axis are the unknown quantities and $2\sqrt{2}$ is incalculable. To find these

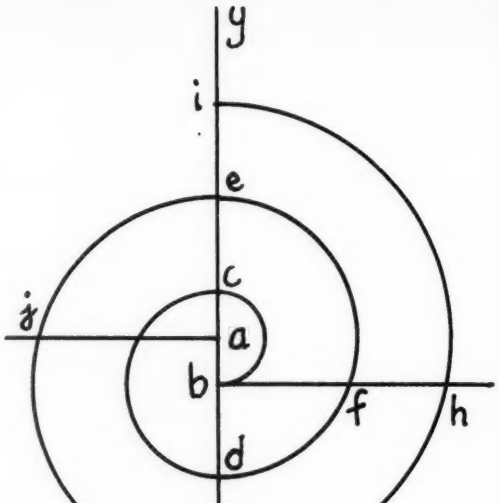

Fig. 3. Spiral, with transversal axes added, redrawn from p. 40 *e*.

distances, one need only draw the 'Archimedes' spiral shown in the adjacent figure of the manuscript (fig. 8 *e*).[7]

The spiral of Master 2 is not a true Archimedes spiral, which is generated by moving parts, but is made of semicircles drawn from two centers lying on an axis (fig. 3 *y*). The construction is simple. Let the first center be *a*, the radius of the first semicircle $\widehat{ab}$ (=1), and the second center *b*. Then *cd* forms the second semicircle, with r=2, $\widehat{ad}$ the third semicircle, with r=3, and so on. If a line perpendicular to *y* is projected from *b*, it intersects the third semicircle at *f*, and $bf=2\sqrt{2}$, the incalculable dimension required for the third-point keystone. That such a line is not shown in the diagram merely means that it was not necessary to draw it in, for the mason's square (represented in fig. 8 *b*) could simply be laid along *y* with *b* in the corner, both *bf* and *ba* marked on it, and the instrument then transferred to the stone and the marks used to complete the setting-out of IK and KF. The ordinary mason did not in fact have to know he was dealing with an irrational number.

The fifth-point keystone is equally simple. In view of Master 2's caption, the marks in 40 *d* must be taken to represent five equal units. The incalculable side of the

4. See, for instance, J.-A. Brutails, ' "Tiers-point" et "quint-point" ', *Bulletin archéologique du comité* (1902), pp. 273–279.

5. The early thirteenth-century keystone may be a single stone sloping down on both sides from the apex of the arch, or it may be formed by two stones with a common bed lying on the vertical axis of the arch. Both kinds are often found together in compound arches, where each set of voussoirs is staggered with respect to the adjacent ones, in order to insure a better bond. Thus the keystones of each component arch are alternately a single stone and twin stones separated by a vertical bed, as, for instance, at Bourges Cathedral. Brutails (p. 276) misquotes Choisy on this point.

6. E.g., p. 39 *r* or p. 40 *g*.

7. Viollet-le-Duc's explanation of the spiral as a means of calculating the various ribs of the vault is difficult to accept, if only in view of the considerable size of the latter. *Dictionnaire*, VI, 442.

triangle is $2\sqrt{6}$, or *bh* on the spiral, while the shortest side is still 1, or *ba*.

Willis noted that the third-point keystone could only be situated above an arch that in modern times would be called fourth-point, that is, with the base divided into four equal sections and the centers located one-fourth of the way in from each end.[8] Instead of questioning the terminology, he decided that the draftsman must have intended the three units of the diagram to represent four spaces. It would seem, however, that Master 2's terminology, as well as his diagram, may have been perfectly correct. The points of the base should not be confused with the spaces they mark off and they must be counted starting with 0 at the end, and not 1, as in the Roman method; then the third point from the left, for instance, forms the center for the left-hand arc (fig. 4). In other words, the radius of the *tiers-point* arch is ¾ of the base, just as the radius of the *quint-point* arch is ⅝,[9] and the mason could set out either keystone merely by knowing the name of the arch it was to crown.

The procedure noted in shorthand by Master 2 is therefore completely logical, and it has some interesting consequences. If the position of the centers is constantly increased by 1 and the number of base divisions by 2 (2/2, 3/4, 4/6, 5/8, 6/10, 7/12 . . .), a series of arches and keystones is formed for which the spiral will continue to provide the unknown quantities ($\sqrt{3}$, $2\sqrt{2}$, $\sqrt{15}$, $2\sqrt{6}$, $\sqrt{35}$, $4\sqrt{3}$ . . .), while the short side of the keystone triangle remains 1.[10] And as the number of divisions across the base increases, the spiral accommodates only the lower arches.[11] The verification of such a limitation in the monuments of the first half of the thirteenth century in northern France would be a most valuable contribution to our knowledge of Gothic techniques. What will probably always remain unfathomable, however, is how the Gothic mason, generally considered to be ignorant of more than the simplest mathematical calculations, came to use the system.

The use of the spiral in setting out a keystone made it unnecessary to trace the arch at full scale, a step that must often have been difficult in the limited area available in the thirteenth-century lodge. This tends to confirm the conclusions that can be drawn from several other diagrams of Master 2.[12] But the connection of the manuscript figures with actual working procedures would remain highly theoretical, were it not for the fact that several similar spirals are preserved on the stone from Chartres Cathedral, giving us a fair idea of their size in real practice.

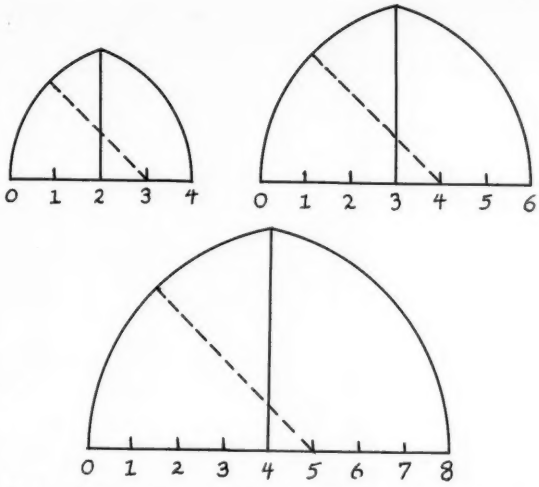

Fig. 4. Third-, fourth-, and fifth-point arches, numbered in the presumed thirteenth-century manner.

The stone at Chartres originally served as a capital for one of the piers of the south transept porch (figs. 5 and 6). It now measures about 168 by 78 cm. and represents a bold design, in that the upper corners form clusters of five small, almost independent capitals, of which three rested on isolated, monolithic shafts. Even with the small load of the porch vaults resting upon them, the clusters seem to have broken off, and this is undoubtedly why the stone was replaced. It is now preserved in the chamber of the south tower.

On the lower bed of the capital are traced the normal axes that were used to set out the plan of the piece, in addition to some inexplicable lines (fig. 6). There are one axis in the center, three to the left, a short one delimiting the small half-capital to the upper right and a transversal one reaching to the half-capital on the opposite side. The spirals are located on the central axis and on a now-lost axis to the right. Since two of the spirals (B, C) are incomplete, the original stone was probably larger when they were traced (at least 168 by 92 cm.). And the coincidence of the central axis of the capital with the axes of spirals A and B seems overly fortuitous. It is more likely that the capital was intended to be cut from a stone sufficiently large to allow the mason some leeway in its setting-out and execution, that the central axis was drawn at an early moment as a reference mark, and that the stone was then used as a tracing surface in the shop before the final

8. Willis, *Facsimile . . . Wilars de Honnecourt*, pp. 141–142.

9. These proportions were already noted by Brutails, p. 277.

10. Obviously certain multiples of the original series, such as 6/8 and 8/12, can also be used, but a number of possibilities, such as 5/6, 7/8, and 7/10, are excluded because the short side of the triangle would be greater than 1.

11. This obtains both in the original series and in the acceptable multiples, e.g., 8/12 and 9/12, but not 10/12. Brutails' conjecture that the third-point may indicate the more obtuse, and the fifth-point the more acute, arches, is therefore incorrect (p. 278).

12. Cf. Robert Branner, 'Three problems from the Villard de Honnecourt manuscript', *Art Bulletin* XXXIX (1957), 61–66.

Fig. 5. Capital, from south transept porch, lower bed, Chartres Cathedral (courtesy Courtauld Institute of Art).

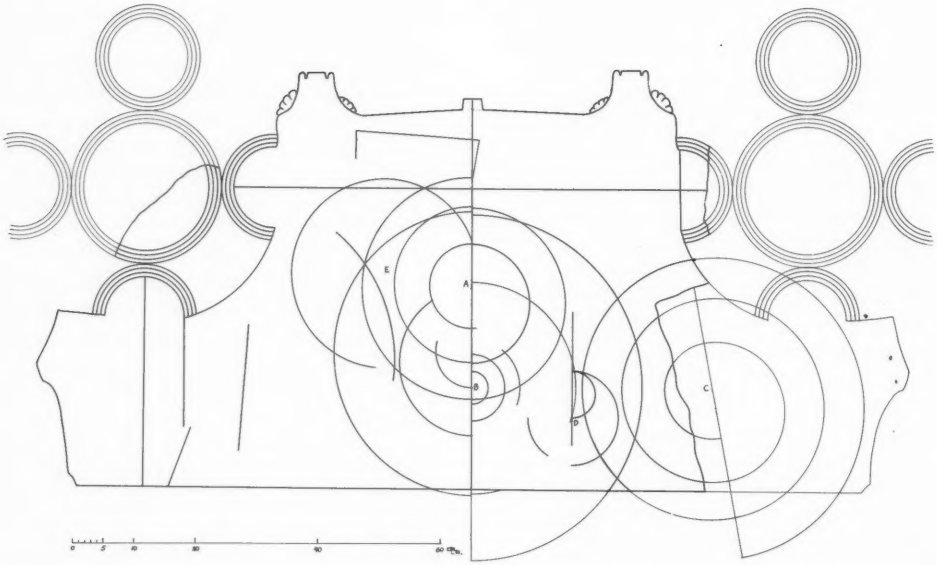

Fig. 6. Capital, from south transept porch, lower bed, Chartres Cathedral. Measured drawing: dark lines indicate extant portions, light lines indicate reconstituted portions (axis of C hypothetical).

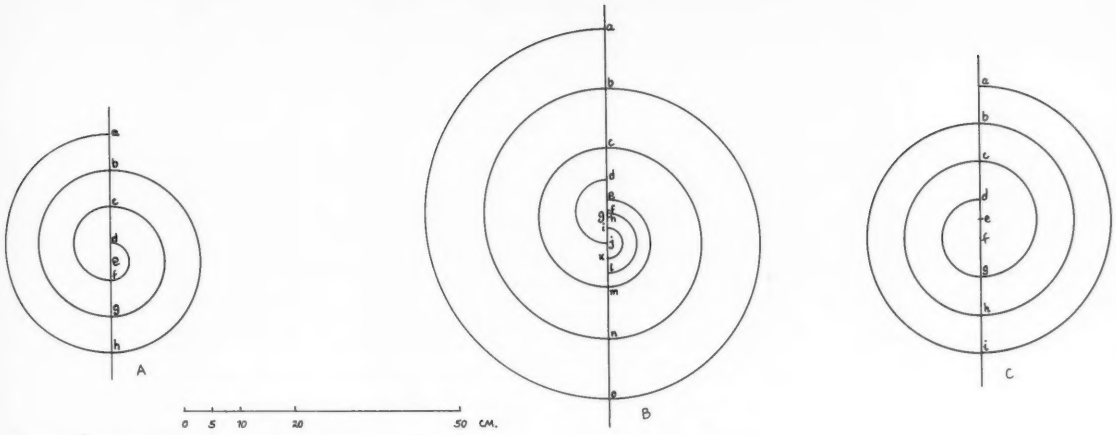

Fig. 7. Spirals from capital, Chartres Cathedral.

cutting and the sculpture were made. This span of time in turn suggests a kind of mass production whereby a number of similar pieces were rough cut and only partly finished in one operation. The capitals of the porch piers are in fact composed of sixteen pieces, seven of which are identical with the one in question and eight of which are smaller, but alike, one to the other.

All the lines on the capital are lightly engraved and in some cases they seem not to have been completed, for obviously they could not have worn off here. Many of them, such as D and E, some of the arcs in B, and perhaps one of the fragmentary axes, are unrelated to either the spirals or the capital and seem at present to have no logical explanation. Furthermore, there is a fundamental difference between A and C, and B. In the first two, the second center is taken midway between the first center and the circumference (fig. 7 C, *e*), rather than on the latter (*b*). Thus the internal relationships of each spiral are reduced by half. This is the same construction as the one used by Dürer, although he constructed the spiral in reverse, starting with the largest semicircle and working inward.[13] It is just as effective in setting out a keystone as Master 2's system, for where the incalculable side of the triangle is $\sqrt{2}$, the second radius is 3/2. And the mason's square could be used to mark off the distances, although it would first have to be slid along to the other center. In B, on the other hand, Master 2's system is used. Extra semicircles ($\widehat{ik}$, $\widehat{gl}$) are fitted into the initial one ($\widehat{em}$), however, and the semicircle on the left ($\widehat{mc}$) was probably drawn from the center *h*, approximately halfway between *e* and *j*, making this part of the spiral a variant of the system of A and C.

The real dimensions of the spirals have only a general importance for the dimensions of the keystones, since the relationship between the two is proportional. In actual operation, however, too small or too large a spiral would be inefficient: the former would lack accuracy, the latter might exceed the surface of the block from which the keystone was to be cut. The initial radii at Chartres are quite small but the maximal sweeps are large, and the presence of three separate spirals may reveal a search for the most efficient size. Furthermore, the spirals are poorly drawn. The centers of A and B form small, irregular holes in the stone, as if the sharp point of the compass had frequently been set in them, and they are not consistent, varying up to 1.7 cm. from the true centers.

At Chartres, the arches of the south transept porch seem to conform to the fourth-point design, in the terminology proposed here, and the keystones would therefore have been set out on the same system.

Interesting as the spiral and the keystones are, they seem at first glance to have nothing to do with Villard de Honnecourt, since the set of figures on the top of p. 40 was drawn by Master 2.[14] The latter is known to have effaced portions of the manuscript in order to enter some of the diagrams, however, and the faint marks at the top of the page consequently take on a new importance (fig. 8). Under ultra-violet light they can be seen to represent the remains of five figures (fig. 9): M, a right triangle of unknown meaning at the present; N, a keystone similar to

13. A. Dürer, *Underweysung* . . . (Nürnberg, 1525), fig. 6; cf. M Steck, *Dürers Gestaltlehre der Mathematik und der bildenden Künste Mathesis universalis*, I (Halle, 1948), pp. 25–26. It was also used by Juan Arfe y Villafañe later in the sixteenth century. *Varia Commensuracion para la escultura y arquitectura*, I, i, 9, 7th ed. (Madrid, 1795), pp. 5–6.

14. Hahnloser, *Villard de Honnecourt*, pp. 195–198.

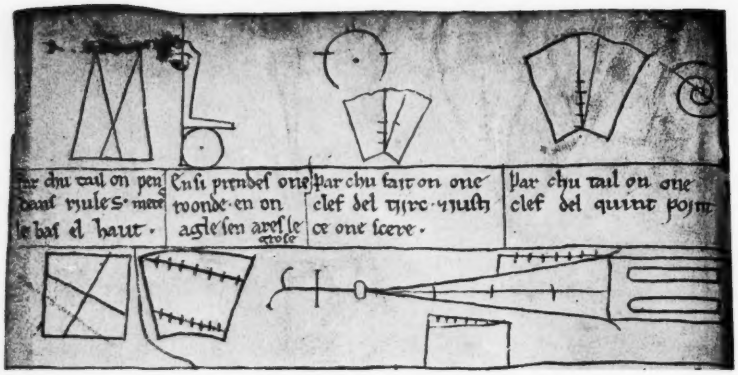

Fig. 8. Paris, Bibl. Nat., fr. 19,093, detail of page (from Omont, *Album de Villard*, pl. XI).

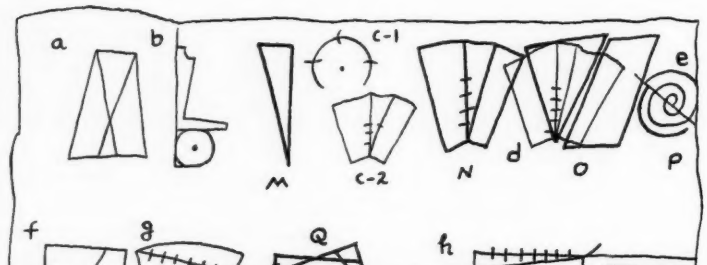

Fig. 9. Sketchbook of Villard de Honnecourt, detail of page with palimpsested figures in heavy lines (redrawn).

c–2 or *d*, on which there seem to be four marks indicating the fourth-point system; O, a triangle and trapezoid, in all probability designating still another keystone design; P, an extra semicircle on the spiral, *e*; and Q, the pentagonal tower repeated in p. 41 *c*. N and P are of particular importance, since they indicate the first draftsman knew the keystone technique and the uses of the spiral.

The alignment of these palimpsested figures in bands resembles the work of Master 2, but it is doubtful whether he would have drawn them, only to efface them and redraw some of them in other places. It is possible that they were the work of the evanescent Master 1, who perhaps wrote the now effaced text on p. 39.[15] But it is more likely that they were the work of Villard himself. He seems occasionally to have moved his own figures around, for p. 41 *h* repeats the effaced diagram found between the pear tree and the plan, at the top of the page. And even if he was not preoccupied by scholastic models to the same extent as Master 2, he was also given to aligning small figures across the page (cf. pp. 36–37).

Villard is known to have visited Chartres, where he drew the rose window and several figures from the south transept porch, among which was probably the engaging lion of p. 48, as Kidson has recently suggested.[16] While it is not possible to prove that he learned the keystone technique there, the presence of the fourth-point arch in the porch and the fourth-point keystone in the manuscript suggests that this may have been the case. Villard's trip to Chartres would therefore have taken place shortly after the porch was begun, very probably in 1225.[17]

15. Cf. Robert Branner, 'Note on Gothic architects and scholars', *Burlington Magazine*, no. 115 (1957), pp. 372, 375.

16. P. Kidson, *Sculpture at Chartres* (London, 1958), pp. 55–56.

17. Preparations for the construction of the porch seem to have been underway in 1224, when a lean-to on the site was demolished; see L. Grodecki, 'Chronologie de la cathedrale de Chartres', *Bulletin monumental*, no. 116 (1958), pp. 91–119, with bibliography.

Michelangelo and the Porta Pia*

ELISABETH B. MAC DOUGALL Radcliffe College

In the first half of the sixteenth century the densely populated center of Rome was still surrounded by relatively uninhabited land on the seven hills and by farms and vineyards along the perimeter of the Aurelian walls. Members of the nobility and the College of Cardinals escaped from the unpleasant living conditions of the center by constructing retreats in the higher open areas. One of these, the ridge of the Quirinal Hill, from its summit at the Monte Cavallo to the Porta Nomentana, was especially popular both for its healthful elevation and its convenience to the center of the city. By 1559 when Pius IV was elected to the papal throne, a suburb of sumptuous villas had been built which extended as far as Santa Susanna and the Baths of Diocletian along either side of the road then called the Alta Semita.[1] Its continuation, the Via Nomentana, wandered through farms and orchards to the city gate.

Sometime soon after his election Pope Pius IV turned his attention to a number of civic improvements including the straightening and leveling of the Alta Semita and Via Nomentana.[2] The Via Pia, as the improved street was named, started at the statues of the Dioscurides on the Monte Cavallo,[3] followed the old course of the street as far as the Baths of Diocletian, and then was straightened so that it ran directly to a point in the Aurelian wall between the Porta Nomentana and the Porta Salaria (fig. 1). It still survives today as the Via Quirinale and the Via XX Settembre.

A new gate, the Porta Pia, was commissioned and the Porta Nomentana was closed.[4] Vasari reports that the Pope requested Michelangelo to design the gate and that three 'stravaganti e bellissimi' projects were submitted, of which the Pope chose the least expensive for execution.[5] After the foundations had been started in March, the cornerstone for the new gate was laid on 18 June 1561. In July a contract was drawn between the Vatican, the *Maestri delle Strade*, and Pietro Luigi Gaeta, the contractor.[6] Work proceeded rapidly at first, and by May 1562 the coat of arms in the attic of the gate had been paid for (fig. 2).[7]

It has been customary to assume that the central projecting attic was incomplete at Michelangelo's death in February 1564, and that it remained so until the nineteenth century. Recently, however, Zanghieri has suggested that the gate was completed in the months between Michelangelo's death and the dedication ceremonies in June of that year.[8] Since reliable representations of the gate after 1580 show only the lower part of the attic, he proposes that structural weaknesses due to the hasty completion caused the upper part to fall within a few years. It would seem strange that such a noteworthy event

* This article is an expanded version of a speech given at the Society of Architectural Historians Annual Meeting, 28 January 1960. It originated as part of a report for a seminar on Michelangelo conducted by Professors Coolidge and Freedberg at Harvard in 1957. I would like to take this opportunity to express my gratitude to them and to Professor Ackerman of the University of California, Berkeley, for their unfailing generosity with advice and assistance throughout the various stages of preparation of this paper.

1. For a description of the villas along the Alta Semita and the nature of the development of this suburb, see Rodolfo Lanciani, *Storia degli Scavi di Roma*, 4 vols. (Rome, 1912), IV, 92–95.

2. Ludwig Pastor, *History of the Popes from the Close of the Middle Ages*, 38 vols. (London, 1928), XVI, 435–438.

3. There is evidence that Pius IV intended the street to continue as far as the Piazza di Venezia on a line very similar to the present Via 4 Novembre and Via 24 Maggio. A description by Ferrucci was published in A. Fulvius, *L'Antichita di Roma* (Venice, 1588), fol. 23. It also appears in Lanciani, *Storia degli Scavi*, III, 232–233.

4. The commission is mentioned in a letter dated 18 January 1561 from the Mantuan ambassador in Rome to the Duke of Mantua. Published in Pastor, *History of the Popes*, XVI, 463.

5. Giorgio Vasari, *Le vite de' più Eccellenti Pittori, Scultori ed Architetti*, Milanesi (ed.), 7 vols. (Florence, 1878–1885), VII, 260.

6. Published with the payment records by A. Bertolotti, 'Documenti intorno a Michelangelo Buonarotti trovati ed esistenti in Roma', *Archivio Storico Artistico Archaeologico e Letterario della Citta e Provincia di Roma* I (1875), 75–76.

7. Bertolotti, 'Documenti . . .', p. 76.

8. Giovanni Zanghieri, *Il Castello di Porta Pia di Michaelangiolo—1564 al Vespignani–1864—e ad oggi* (Rome, 1953), p. 19.

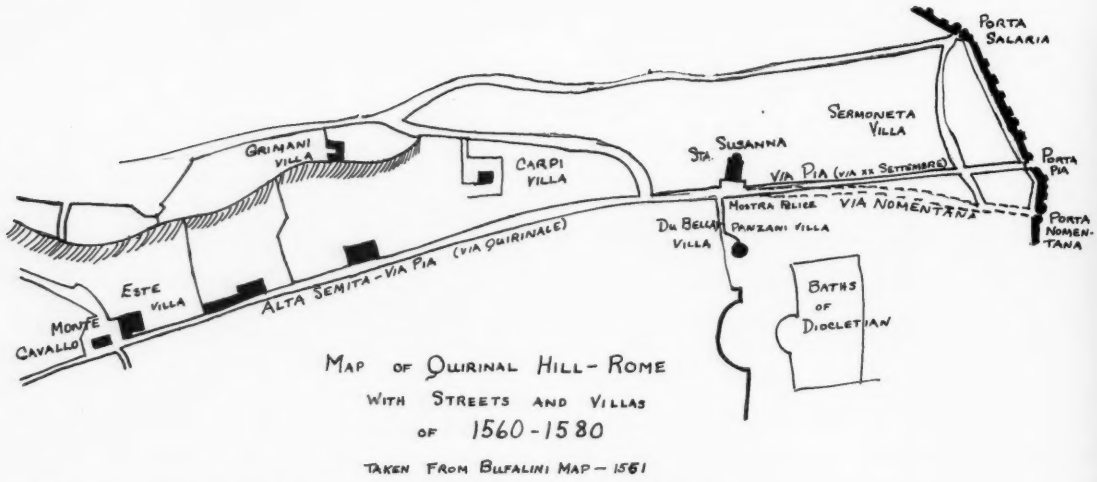

Fig. 1. Map of the Quirinal Hill, Rome, as in the sixteenth century (drawing by author).

Fig. 2. Porta Pia, Rome (photo: Alinari).

Fig. 3. Via Pia, Rome, fresco in the Lateran Palace (courtesy Gabinetto Fotografico Vaticano).

Fig. 4. *Modello* of the commemorative medal for the Porta Pia (from Schiavo, *Michelangelo Architetto*).

should escape the attention of the sensation-loving Romans, yet no account has survived in the numerous diaries and letters of the period. Moreover, there are no trustworthy views which show the gate complete, nor do the surviving documents allow an estimate of the extent of the construction carried out just before or just after Michelangelo's death. Thus, in the absence of any real supporting evidence, Zanghieri's hypothesis can neither be accepted nor totally rejected.

It is, however, certain that by 1587 the upper part of the gate did not exist. A fresco of the Via Pia in the Lateran shows the attic complete only up to the central roundel (fig. 3),[9] and all subsequent representations show the same state.[10] Finally, in the nineteenth century, after the Porta Pia was struck by lightning, Pius IX commissioned Vespignani to rebuild or complete the attic, which was also made higher at this time, to repair the damages, and to execute the external face of the gate.[11] In 1888 lateral passages were opened in the Aurelian wall making the gate the isolated block it is today (fig. 2).[12]

The Porta Pia is unique among Michelangelo's last architectural commissions, first because it was nearly complete at his death, and second because a large number of preliminary sketches for it have survived. By tracing the evolution of the design in these sketches it is possible to determine something of Michelangelo's creative processes during his last years.[13] However, none of the sketches is for the entire gate and almost all are designs for the portal (figs. 6–15). Only one document for the total design has survived which dates from the period prior to Michelangelo's death, namely, Bozagni's *modello* for the commemorative medal buried in the foundations in June 1561.[14]

9. A *terminus post quem* for the fresco is given by the *mostra* of the Acqua Felice in the right middle distance. This was finished in 1587. See Lanciani, *Storia degli Scavi*, IV, 159.

10. These include the Tempesta map of Rome (1593), the Greuter map (1618), de Rossi (1668), Falda (1676), etc. For additional representations see P. Arrigoni and A. Bertarelli, *Piante e Vedute di Roma e del Lazio Conservate nella Raccolta delle Stampe e dei Disegni-Castello Sforzesco* (Milan, 1939), p. 290.

11. Zanghieri, *Porta Pia*, pp. 72–74. An external gate was part of the original design but was never executed. See Armando Schiavo, *La Vita e le Opere Architettoniche di Michelangelo* (Rome, 1953), pp. 265–267. No drawings have survived which may be identified as projects for this gate.

12. Zanghieri, *Porta Pia*, pp. 72–74.

13. Drawings for the Porta Pia were first identified by H. Thode, *Michelangelo, Kritische Untersuchungen über seine Werke*, 3 vols. (Berlin, 1908–1913), III, *passim*, and Karl Frey, *Die Handzeichnungen Michelagniolos Buonarotti*, 3 vols. (Berlin, 1909–1911), *passim*. The first attempt to arrange them chronologically and to relate the Porta Pia to other buildings by Michelangelo is to be found in the article by Charles de Tolnai, 'Beiträge zu dem späten architektonischen Projekten Michelangelos', *Jahrbuch der preussischen Kunstsammlungen* LI (1930), 42–45. Zanghieri, *Porta Pia*, has contributed valuable information concerning the subsequent history of the gate, but he does not discuss Michelangelo's drawings for it.

14. Karl Frey, 'Studien zu Michaelagniolo Buonarotti und zur Kunst seiner Zeit', *Jahrbuch der preussischen Kunstsammlungen* XXX (1909), Beiheft, 166. The coin differed slightly from the *modello*. See F. Buonanni, *Numismata Pontificiorum romanorum*, 2 vols. (Rome, 1699), II, 272.

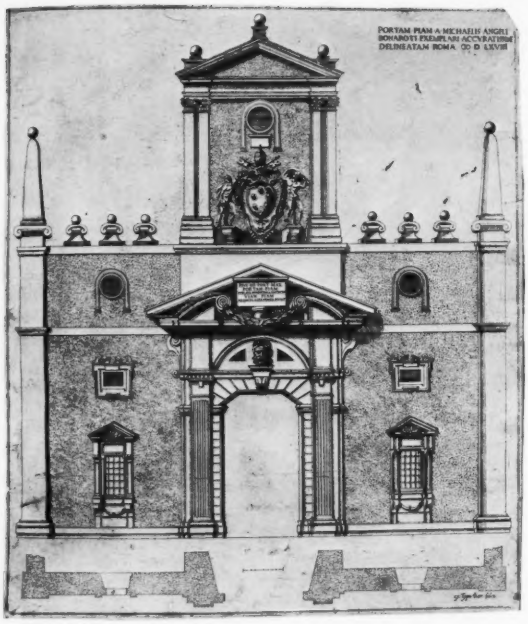

Fig. 5. Faleti engraving of the Porta Pia, 1568 (from Lafréri, *Speculum Romanum*).

A comparison, however, of the gate design on the medal with the actually constructed gate shows a number of significant differences. The medal gate (fig. 4) is clearly more fortress-like, more nearly traditional than that executed. The towers and the crenellated sidewalls recall, yet are not identical with, the fortress-like gates elsewhere in Rome.[15] The gate today is singularly devoid of reference to fortification. In addition, the gate on the medal appears to be set into the city walls, while the internal face of the existing gate projects twenty-five meters into the city, and a courtyard, or *cavedium*, intervenes between it and the city walls.[16]

There are also differences in articulation and decorative detail. The medal is too small for details to be reproduced accurately but it is possible to see that the basic scheme of articulation is developed from a series of strong horizontals. In the executed gate the direction of emphasis is changed. A high attic is substituted for the low one of the medal. This, coupled with the placing of pilaster-like mouldings at each corner, introduces a new vertical emphasis which is reinforced by the correspondingly different treatment of the portal. In the medal the division between the door jambs and the segmental pediment above is clearly marked by a heavy horizontal, while in the actual gate the entablature has disappeared and the upper cornice is broken back to the plane of the wall itself. The triangular pediment continues the vertical movement, and in this way the central portion of the gate, which comprises both the portal and the attic, becomes the dominating element of the composition.

Further evidence of the importance of the verticals in the erected gate is given in an engraving of it by Faleti, dated 1568, showing two obelisks which appear in no other representations of the gate (fig. 5).[17] They evidently never were executed but must have formed part of Michelangelo's design.[18] They continue the vertical line of the pilaster forms and create secondary vertical axes. Thus, in the interval between the creation of the medal and the actual construction of the gate three major changes took place in its design. It was changed from a fortress type to its present unconventional form, it was moved from a position in line with the Aurelian walls to a point twenty-five meters within the city, and finally, the directional emphasis of the design became vertical rather than horizontal.

It is possible to trace the evolution of design, at least of the portal, from the medal to the final project. Evidently the essential dimensions and form of the gate, with the exception of the attic, were established from the start and changes were restricted to decorative detail and the portal. Thus all but two of the surviving drawings are for the portal, and none appears to precede the medal design.

Closest to the medal is Dussler 134 recto,[19] a rendering by an assistant (fig. 6). The broken segmental pediments enclosing shells are identical in the medal (fig. 4) and the drawing. However, the latter represents a step away from the medal design. The entablature is broken to make place for a tablet, which replaces the more conventional mouldings in the medal design, while impost blocks have replaced the capitals. All these features create an increased vertical emphasis which is further enhanced in the treatment of the pediment. The enclosing upper pediment of

15. G. B. Giovenale, 'Le porte del recinto di Aureliano', *Bulletino della Commissione Archaeologica Communale di Roma* LIX (1932), 9–116.

16. Armando Schiavo, *Michaelangelo Architetto* (Rome, 1946), fig. 163. I wish to thank Professors Coolidge and Ackerman for their interpretation of the position of the gate on the medal.

17. The engraving appears in most collections of the Dupérac-Lafréri, *Speculum Romanae Magnificentiae*.

18. Zanghieri, *Porta Pia*, p. 18, n. 10, cites a reference I have been unable to check (Maes, *Thesaurus Romanus* 79, pp. 13136, 13141) to the desire of Pius IV to erect an obelisk on the Porta Pia. The triangular pediment which appears in the engraving was never erected. Its dull, classicistic form suggests it was designed by an assistant after Michelangelo's death.

19. I have used the numbering system from Luitpold Dussler, *Die Zeichnungen des Michelangelo* (Berlin, 1959). For the first time it is possible to refer to Michelangelo's drawings with a unified numbering system. A list of the drawings referred to here is appended, giving a description of each and cross references to the Frey, Thode, and de Tolnai numbers.

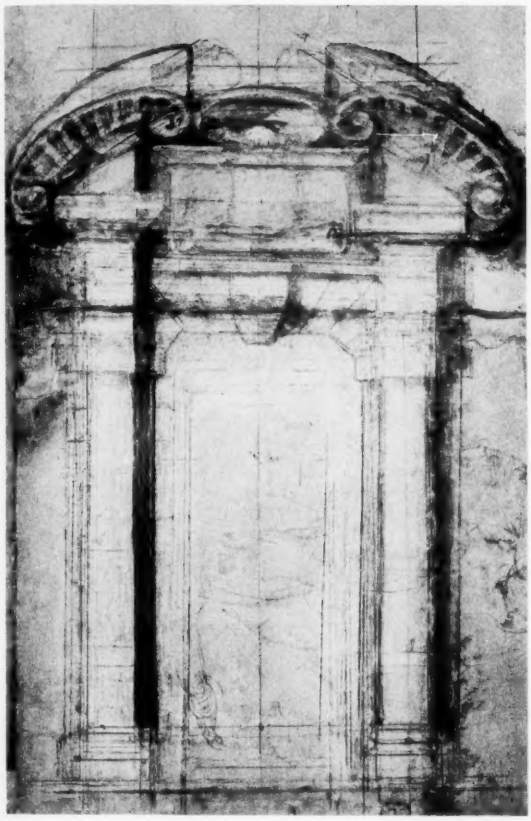

Fig. 6. Assistant's rendering for the Porta Pia. Dussler 134 recto (photo: Alinari).

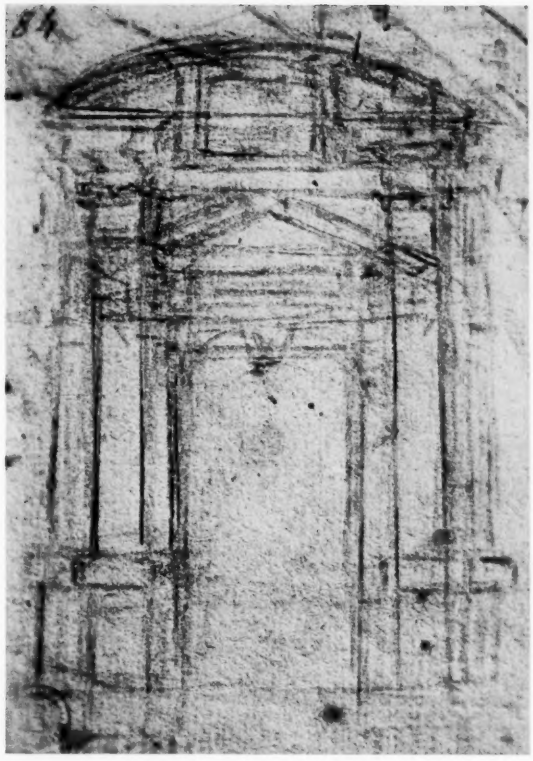

Fig. 7. Preparatory sketch for the Porta Pia, by Michelangelo. Dussler 118 (courtesy Soprintendenze alle Gallerie di Firenze).

the medal design is now broken at the same line as lower carved volutes: thus, no horizontal line breaks the clear vertical progression.

In Dussler 118 (fig. 7), a black chalk drawing by Michelangelo, two new ideas appear simultaneously: one in which the segmental pediment, tablet, and impost blocks of the last sketch appear, with the addition of high bases for the pilasters. This project is sketched over the second scheme, a simpler and lower portal topped by a triangular pediment. Dussler 470 is an assistant's rendering of this surprisingly classicistic design (fig. 8).[20] The next step is to be found in Dussler 129, an autograph black chalk drawing with ruled ink lines, and the only sketch in which portions of the entire gate appear (fig. 9). Paired pilasters on plinths flank the portal, and the low attic of the medal design is shown with two windows in it. The portal is drawn on a larger scale—it covers the windows of the lower section—and is the first indication of the executed pediment; that is, a triangular pediment enclosing volutes.

Another sketch, Dussler 240, seems to represent the same stage of design as the last drawing (fig. 10). Here, as often happens in Michelangelo's drawings, sketches for different buildings appear on the same sheet. The ground plans at the top of the sheet have nothing to do with the Porta Pia. The portal on the lower left, however, has the triangular pediment, broken cornice, impost blocks, and fluted pilasters of the final design. Although the sketch in the upper right was started for a window frame, the pediment is evidently a more detailed experiment with the volutes and pediment which appeared in Dussler 129 (fig. 9).

Finally, all the various ideas coalesce and a rendering is done, Dussler 476 (fig. 11). In technique and character it is similar to Dussler 134 recto (fig. 6)—presumably both were presentation or working drawings prepared by an

20. It is unfortunate that the records of Vespignani's work on the Porta Pia have never been discovered. The resemblance between his external gate, illustrated in Zanghieri, *Porta Pia*, fig. 31, and this design is very close.

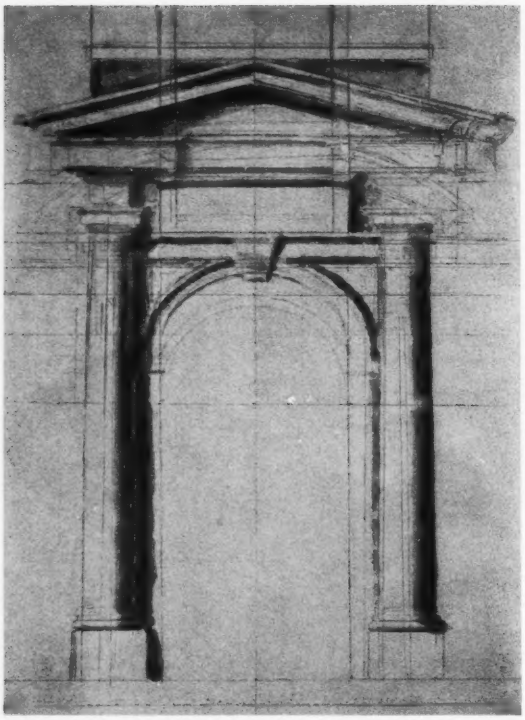

Fig. 8. Assistant's rendering for the Porta Pia. Dussler 470 (photo: Alinari).

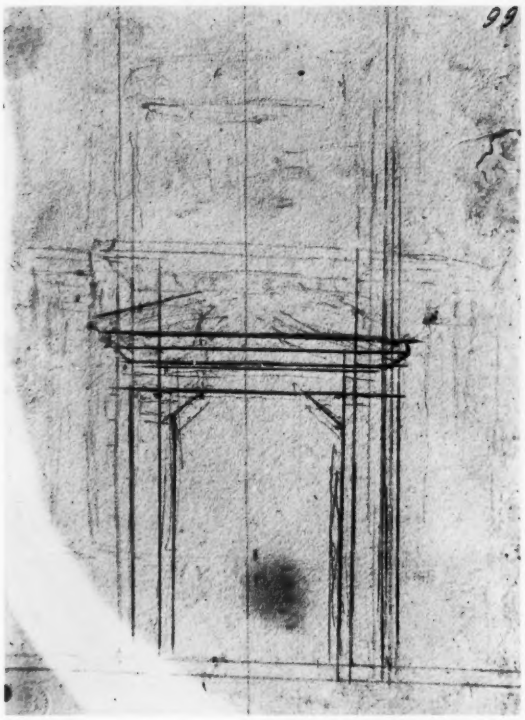

Fig. 9. Preparatory sketch for the Porta Pia, by Michelangelo. Dussler 129 (courtesy Soprintendenze alle Gallerie di Firenze).

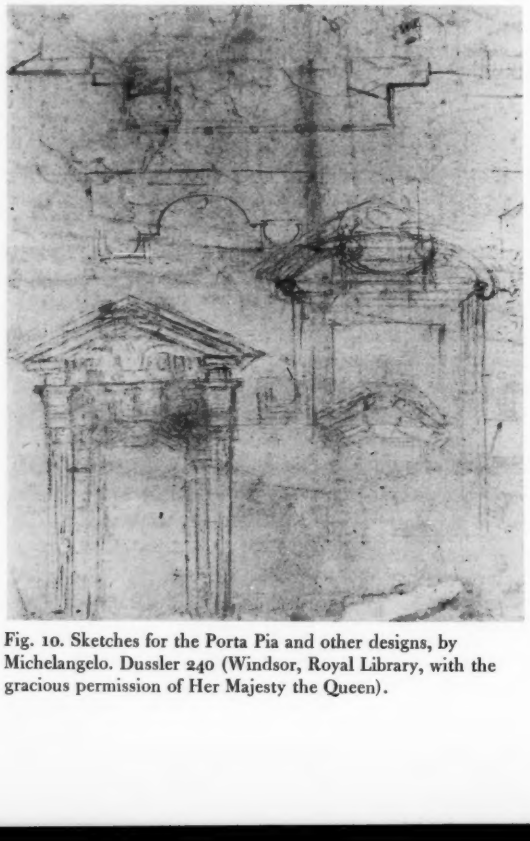

Fig. 10. Sketches for the Porta Pia and other designs, by Michelangelo. Dussler 240 (Windsor, Royal Library, with the gracious permission of Her Majesty the Queen).

assistant and then reworked, possibly by Michelangelo.[21] The drafted rendering, Dussler 476, combines the ideas developed in the three previous drawings. The curved pediment from Dussler 118 (fig. 7) is supported by columns and impost blocks like those in Dussler 136 recto (fig. 6), while the flat arched doorway derives from the latter and Dussler 240 (fig. 10). Several different projects have been sketched over this original rendering. The first places a blind arch with a console in it in the opening above the door. The motif is obviously related to a chalk sketch in the Teyler Museum, Haarlem, Dussler 296 (fig. 12). The apparent scale of the portal in this drawing and the steps leading to the doorway suggest that it is a design for a villa gate rather than for the Porta Pia.[22] Nevertheless

21. Another pair, apparently by the same hand, are Dussler 633 and 634, Cat. Nos. 80, 81 in the Ashmolean Museum, Oxford. They are two window studies, the latter for the upper windows of the Farnese palace courtyard.

22. I wish to thank both Professors Coolidge and Ackerman for this suggestion. The drawing is usually described as a study for the Porta Pia. See appended list of drawings.

Fig. 11. Assistant's rendering for the Porta Pia. Dussler 476 (photo: Alinari).

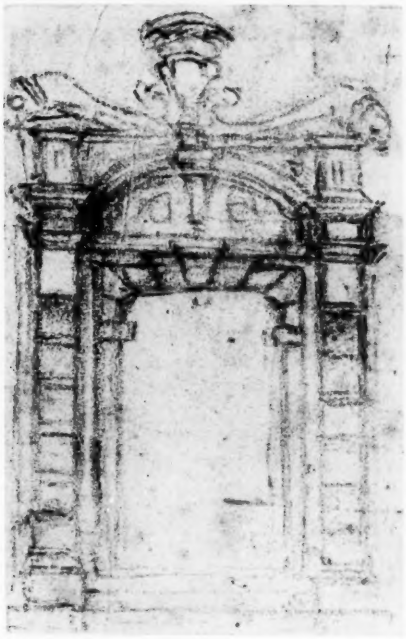

Fig. 12. Sketch for a villa gate, by Michelangelo. Dussler 296 (courtesy Museum Teyler, Haarlem).

it is clear that Michelangelo derived many elements of Dussler 476 (fig. 11) and of the final design from the Haarlem sketch. The final arrangement of the tympanum is also sketched in on Dussler 476. This form, a triangular pediment enclosing two volutes connected by a garland, is derived from Dussler 129 and Dussler 240 (figs. 9, 10).

Dussler 476 is the last sketch by Michelangelo or assistants which survives for the portal, but a little-known drawing by Dosio in the Uffizi records a terminal stage of the design (fig. 13).[23] Although many of the details shown by Dosio are identical to those executed, the main pilasters or columns are neither in the final fluted form nor rusticated as in the earlier projects.[24] Finally, the Faleti engraving shows that elements from Dussler 476 and the Dosio sketch were combined in the actual building of the portal.

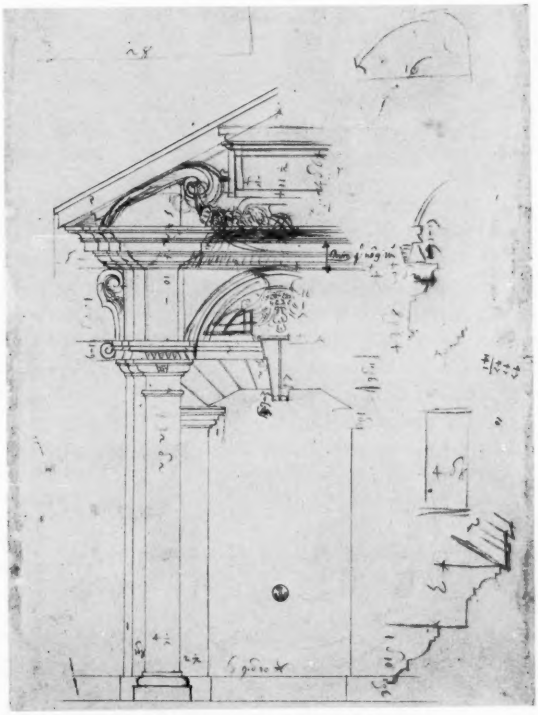

Fig. 13. Drawing of the Porta Pia, by Dosio (courtesy Soprintendenze alle Gallerie di Firenze).

23. Uffizi, dis. arch. 2148. Listed by N. Ferri, *Indice Analitico-Geografico dei Disegni di Architettura Civile e Militare Esistenti nella R. Galleria degli Uffizi in Firenze* (Rome, 1885), p. 189. Also mentioned by Ludwig Wachler, 'Giovannantonio Dosio, ein Architekt des späten Cinquecento', *Römische Jahrbuch für Kunstgeschichte* IV (1940), 241.

24. The measurements on Dosio's drawing indicate he saw a dimensioned working drawing rather than a preparatory sketch. Although Dosio was not meticulously accurate as a copyist, it seems unlikely that the differences between this sketch and the executed gate should be due to his errors, since prototypes for all the forms in this sketch appear in the other preparatory sketches by Michelangelo.

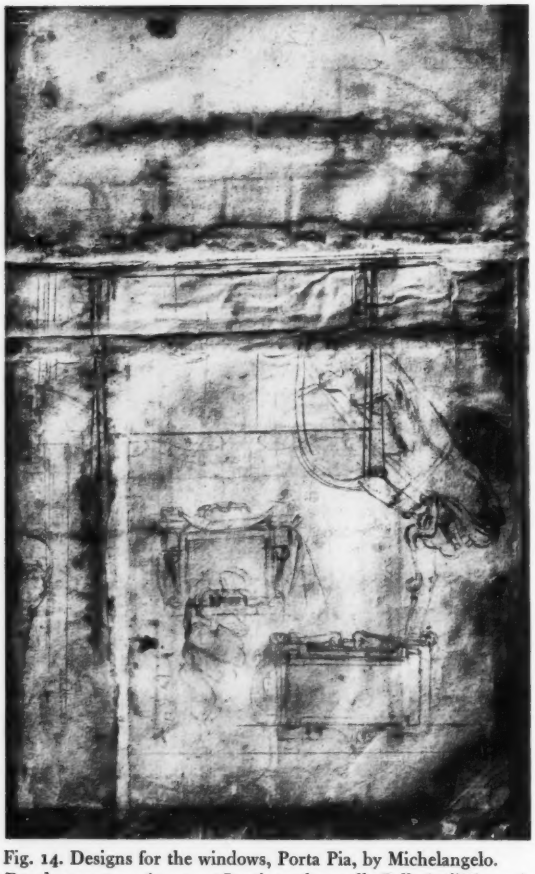

Fig. 14. Designs for the windows, Porta Pia, by Michelangelo. Dussler 134 verso (courtesy Soprintendenze alle Gallerie di Firenze).

Two other drawings which have survived for the Porta Pia are for window and moulding details. One, Dussler 134 verso (fig. 14), has two designs which are related to but not identical with the small, intermediate level windows of the gate. The window as built appears to be a synthesis of these two sketches. Other details are scattered haphazardly over the sheet. An alternate pediment scheme for the portal with vertical scrolls enclosed by a segmental tympanum is drawn in very lightly to the left of the horse's head. In addition, the outline of the baluster forms which top the sides of the gate appears directly above the horse's head at the top of the sheet. The second drawing, Dussler 128 (fig. 15), shows details for the impost block above the main pilasters of the portal and for the lowest side window. A small sketch in the upper right corner of the sheet is usually considered a design for the portal and attic, but is not connected to any of the other portal sketches. It is either an experiment immediately discarded, or possibly is even intended for another monument such as a villa gate.

A study of these various preparatory sketches reveals that there is no clear-cut evolution of the design from the medal project to the executed gate. Different motifs are taken up, combined, and recombined with other motifs in a dialectical process, and finally synthesized into a united whole. Michelangelo's creative process results in an evanescent vision which only reaches a stable form in the hands of assistants. The process of reworking lines and superimposing different designs characterizes all of Michelangelo's late architectural drawings. Although it is clear that this is a mechanical procedure for the development of a design, these sketches may be compared to his late religious drawings in which a parallel process evokes a spiritualized, immaterial world. Similarly, the multiple image in Michelangelo's late architectural drawings documents not only the development of his architectural vision but in itself generates expressive values.

The expressive and subjective qualities in the preparatory sketches are also an important characteristic of the executed gate. Both the portal and other parts of the gate are decorated with an abstracting, anticlassical ornament which is part of the new personal vocabulary developed by Michelangelo in his last years. However, it is important to recognize that many of the motifs which appear in the gate are actually adaptations of elements which had already appeared in Michelangelo's work as early as the 1520s. Perhaps the most unusual features of the Porta Pia are the platter-like forms in the upper level and attic. They are framed by a hanging swag with tassel-like ends which led to Schiavo's eccentric interpretation of the form as a symbol of the tools of trade of the surgeon's profession, and thus a reference to the Milanese Medici, the family of Pius IV.[25]

Instead one might point out that they appear over semicircular pediments in a drawing for the San Lorenzo choir in Florence,[26] as well as over the rounded top of the catafalque in the rejected design for a freestanding tomb in the Medici Chapel.[27] Finally, the identical swag and tassel form is used to decorate the lower panel of one of the designs for a blind window in the Ricetto of the Biblioteca Lorenziana, Dussler 82 (fig. 16).[28]

Prototypes for the overhanging volutes of the medal design (fig. 6) are to be found in the completed catafalques in the Medici Chapel, the Cecchino Bracchi tomb designs,[29] and also in sketches for the edicules in the wall articulation of the Medici Chapel.[30] Thus a form which appears

25. Schiavo, *Vita di Michelangelo*, p. 265.

26. Dussler 87, Casa Buonarotti 45A. Illustrated in Charles de Tolnay, *The Medici Chapel* (Princeton, 1948), no. 66, fig. 96.

27. Dussler 107, Casa Buonarotti 71A. Illustrated in de Tolnay, *The Medici Chapel*, no. 55, fig. 84.

28. Dussler 473, Casa Buonarotti 39A recto and verso.

29. Casa Buonarotti 19F recto and verso, Dussler 50 and his figs. 102, 103.

30. British Museum 1859–5–15–823, Dussler 151 recto and fig. 56.

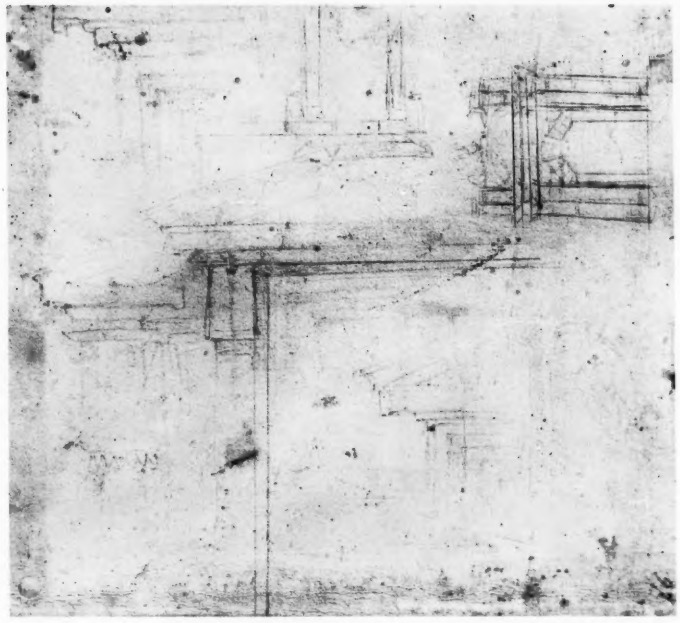

Fig. 15. Sketches for window and moulding details, Porta Pia, by Michelangelo. Dussler 128 (courtesy Soprintendenze alle Gallerie di Firenze).

first as a tomb motif is used for a door pediment, as well as in the balusters of the Porta Pia, and for doors, edicules, etc., in designs for other monuments.[31]

The history of these forms reveals a consistent pattern. Almost without exception the motifs which are used in the gate, or even those in the intermediary designs are found only in preliminary studies for earlier buildings. Thus, Michelangelo appears to have experimented with a number of bizarre decorative forms for his earlier buildings but ultimately rejected them in favor of a more conventional and less varied ornament. Only in his last years do these forms emerge to become an integral and expressive part of his style.

In addition, the role of these forms in the wall scheme changes radically. In earlier buildings a rich profusion of decoration recedes and projects from the plane of the wall. In the Porta Pia, however, the plane of the wall is broken by only a few strong decorative accents, all the more striking for their isolation. The apparent two-dimensionality of the wall is enhanced by the thinness of the horizontal string-courses and of the end piers, the primary articulating members, and by the expanses of bare, undecorated

31. Additional examples: the middle level windows are related to fig. 14 (Dussler 134 v.) and this in turn derives from a sketch for the Lorenziana ceiling, Casa Buonarotti 126A. Dussler 146 and fig, 147. The moulding forms in the ceiling design are also related to one of the discarded schemes for the Sistine ceiling, see Dussler 5 recto and fig. 36.

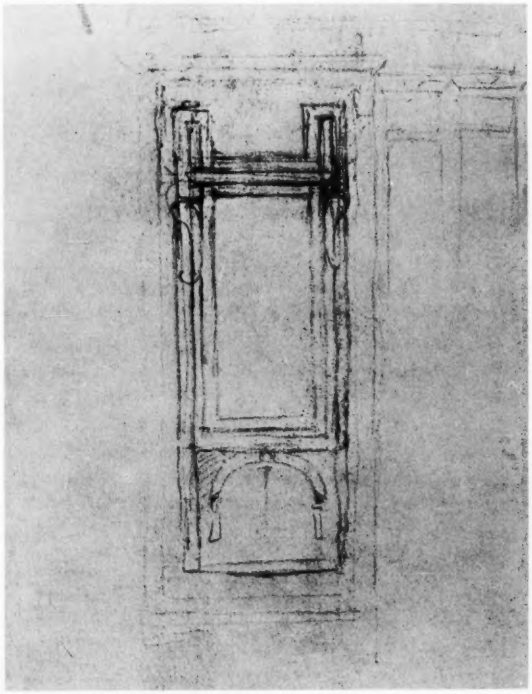

Fig. 16. Preliminary sketch for the Ricetto of the Biblioteca Lorenziana, by Michelangelo. Dussler 82 (courtesy Soprintendenze alle Gallerie di Firenze).

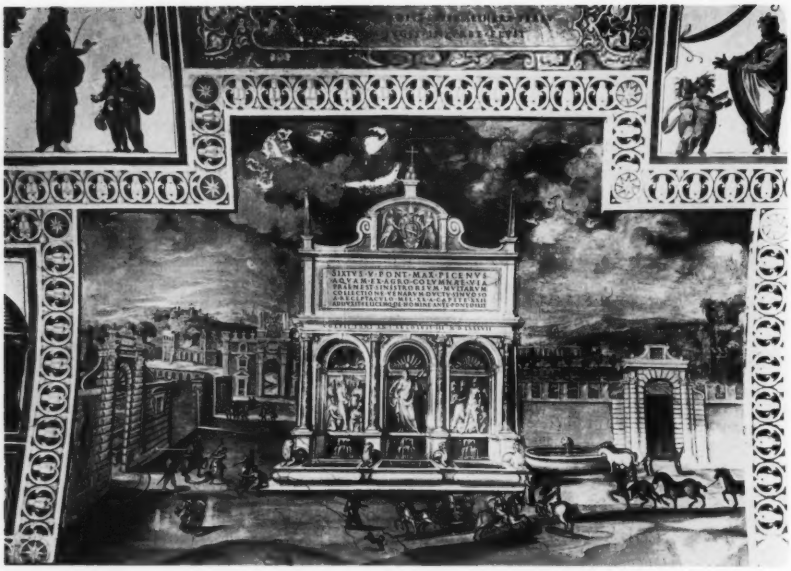

Fig. 17. Via Pia and Porta Pia, Acqua Felice, Rome, fresco in the Vatican Library (courtesy Gabinetto Fotografico Vaticano).

surface. Thus, primary emphasis is focused on the central vertical axis of the portal and attic with their strongly projecting decorative forms. Secondary axes are created by the windows and end piers.

While it is possible to demonstrate the origins of the single forms on the Porta Pia and to analyze their role in the organization of its surfaces, the question of the origin of the whole design remains unsolved. Comparison with contemporary city gates shows that the Porta Pia resembles neither of the two predominant sixteenth-century types. These may be briefly described as the defensible fortress gate, such as the Porta Nuova in Verona, and the symbolical, non-fortified type represented by the Porta del Popolo in Rome.[32] Although both were frequently ornamented by forms derived from the Roman triumphal arch, they differed considerably in form. The fortress gate was surrounded by bulwarks and surmounted by towers or battlements. The nonfortified gate was usually built in a line with the city walls: the double gate with intervening *cavedium* was rare for either type in this century. Both were derived from the city gates of antiquity, and the two types remained distinct throughout the first half of the century.[33]

The Porta Pia design is derived from another type of gate, and this source is explained by the nature of the Via Pia. The street was lined with villas, and a record survives of many of their entrance gates.[34] A fresco in the Biblioteca Vaticana (fig. 17) shows the farther end of the Via Pia sometime after the completion of the fountain of the Acqua Felice which appears in the center foreground. Two villa gates are visible: that of the Cardinal Caetani da Sermoneta on the left, the Panzani Villa gate next to the fountain. The former dates 1561–1564; the latter in the 1570s.[35] These nontraditional yet highly decorative gates are so similar to the Porta Pia that a seventeenth-century editor of Vignola assumed the Sermoneta gate to be designed by Michelangelo. It and two others from the Via Pia, the gate of the villa of Cardinal Ridolfo Pio da Carpi and of Cardinal Grimani, patriarch of Aquileia, appear in the 1607 Vaccarius edition of Vignola's *Regole delle Cinque Ordini* as the *Nuova aggiunta delle Porte di Michelangelo*.[36] Others of earlier date are also known. One, the gate

32. The Porta Nuova, Verona, is illustrated in A. Venturi, *Storia dell' Arte Italiana*, 11 vols. (Milan, 1901–1939), XI, part 3, figs. 269–272. The Porta del Popolo, formerly attributed to Michelangelo, was designed by Nanni di Baccio Bigio and constructed in 1561–1563. See H. Willich, *G. B. da Vignola* (Strasbourg, 1906), p. 91, pl. 38 of the *Nuova aggiunta* in Vignola, *Regole delle Cinque Ordini*, Vaccarius (ed.), (Rome, 1610) shows the gate as it appeared before the seventeenth-century additions and alterations of Bernini.

33. These generalizations are based on regional guides and the *Italia Artistica* series. No study on Renaissance city gates has been published.

34. See footnote 1.

35. Lanciani, *Storia degli Scavi*, III, 182–184. The Panzani Villa appears on the Dupérac-Lafréri map of 1577, but in none before.

36. Giac. Barozzi da Vignola, *Regole delle Cinque Ordini*, Vaccarius (ed.), (Rome, 1607), pl. XLII–XLIV.

Fig. 18. Villa portal, formerly of the Villa du Bellay, Rome (from Ortolani, *S. Bernardo alle Terme*).

Fig. 19. Portal of the Villa d'Este, Fontainebleau, by Serlio (from Serlio, *Libro Extraordinario*).

to the villa of the Cardinal Jean du Bellay (fig. 18), formerly on the site of the present Piazza dell' Esedra, was built between 1554 and 1560.[37] In all probability the three later gates, the Panzani, Sermoneta, and Pio da Carpi reflect some influence of the Porta Pia design, yet a comparison with the two earlier ones and with the thirty villa and garden gate designs in Serlio's *Libro Extraordinario* shows them to be characteristic examples of the urban villa gate (fig. 19)[38].

The urban villa, that is, one built within the walls of a town or just outside, began to develop as a type in the first years of the sixteenth century and by 1560 a conventional form for each of its parts was well established. Unfortunately, the accessibility which made these villas so agreeable also made them victims of the rapid urban development in the next two centuries. Thus, only isolated examples of the gates survive, and it is often impossible to date them exactly. All exhibit a remarkably unconventional approach to the use of classical vocabulary and the same absence of sobriety and staidness which characterize Michelangelo's designs for the Porta Pia. Obelisks and

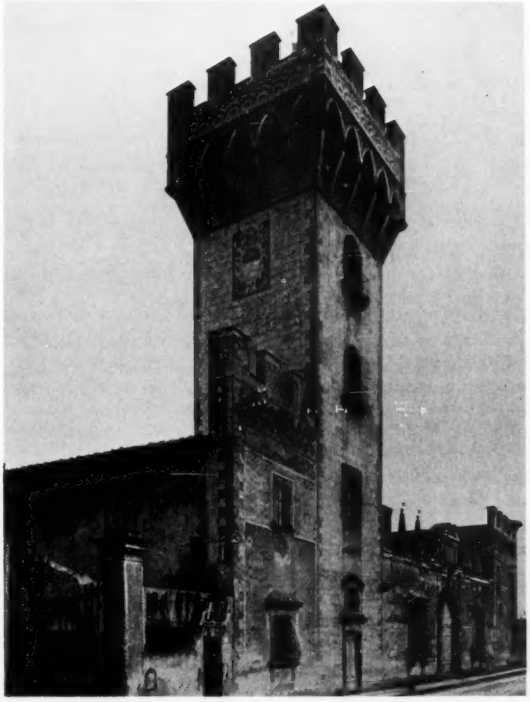

Fig. 20. Villa of Torre delle Agli, Florence (from Lensi-Orlandi, *Ville di Firenze*).

37. Sergio Ortolani, *S. Bernardo alle Terme* (Rome, n.d.), pp. 13–14, fig. 4. This gate is now preserved as one of the entrances to the Museo Nazionale.

38. See W. Dinsmoor, 'The Literary Remains of Sebastiano Serlio', *Art Bulletin* XXIV (1942), 76, for an identification of this book, its illustrations and the editions in which it appears.

pseudo-crenellations are common; rustication, bizarre sculptural decorations appear in many (fig. 20).[39]

By linking the Porta Pia design to the villa gate tradition it becomes possible to explain why Michelangelo changed from the fortress gate medal design to a totally different type. In the months between the completion of the Via Pia and the construction of the Porta Pia new walls and gates were built up along the street. Very soon it assumed the aspect depicted in the Lateran fresco (fig. 3). For Michelangelo the more traditional and fortresslike character of the medal design must have seemed increasingly misplaced as the termination of this pleasantly suburban street. Moreover, the fighting near Rome in the Spanish War of 1556–1557 had demonstrated the futility of defending city walls.[40] Thus, the fortress gate had become obsolete. Michelangelo turned to a design which linked the gate to the street, thus making evident the gate's true function. In the final form, the Porta Pia became the scenographic backdrop at the end of the long vista of the Via Pia. The change from horizontal to vertical emphasis in the design with the focus on the center section came as a solution to the problem posed by the sight lines of the villa walls. As both the Lateran and the Vatican frescoes show (figs. 3, 17), the whole gate was only visible in the small plaza directly in front of it. Elsewhere along the street the villa walls masked all but the center portion of the gate.

Michelangelo's final design was the expression of a new concept of the role of the city gate. Politics destroyed the original function of fortress or passageway. Michelangelo abandoned even the symbolism of defense in a design which derived its form from the internal character of the city. Just as Michelangelo used the individual elements of ornament interchangeably, regardless of the function of the building or monument, so in the Porta Pia he devalued the iconography of an established type. Henceforth, architects used the three types, villa gate, fortress gate, and triumphal arch interchangeably and for a decorative rather than a symbolic purpose.

39. The 1551 Aldovrandi description of the Pio da Carpi Villa published in part by Lanciani, *Storia degli Scavi*, III, 182, reports that the *portone* on the Alta Semita had a gigantic Medusa head over it, and one of the garden gates had two obelisks surmounted by round shields and with a head between them.

40. Pastor, *History of the Popes*, XIV, 138–174.

LIST OF DRAWINGS
referred to in the text by Dussler's numbering system
with cross references to numbering by other writers

1. Dussler 134 recto. Casa Buonarotti 106A recto. Ink and wash. 428 × 277 cm.
   Dussler. 'assistant's rendering for Porta Pia'.
   Thode 70. 'Michelangelo for Porta Pia'.
   de Tolnai, *JPK*, 1930, p. 41, n. 2. See footnote 13 for reference. 'assistant's rendering, related to medal'.
2. Dussler 118. Casa Buonarotti 84A. Black Chalk. 110 × 80 cm.
   Dussler. 'Michelangelo for Porta Pia'.
   Frey 211c. 'Michelangelo, possibly for Campidoglio'.
   Thode 146. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 45, n. 1. 'Michelangelo, second sketch for Porta Pia'.
3. Dussler 470. Casa Buonarotti 73Abis. Black chalk and wash. 380 × 255 cm.
   Dussler. 'assistant's rendering for Porta Pia, related to 476 and 240'.
   Thode 68. 'Michelangelo, not directly related to Porta Pia'.
   de Tolnai, p. 45, n. 1. 'Assistant's drawing'.
4. Dussler 129. Casa Buonarotti 99A. Black chalk and ink. 160 × 120 cm.
   Dussler. 'Michelangelo for Porta Pia. Related to 240 and 128.'
   Thode 154. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 42. 'Michelangelo for Porta Pia'.
5. Dussler 240 verso. Windsor, Royal Library 12769. Black chalk. 257 × 221 cm.
   Dussler. 'Michelangelo for Porta Pia'.
   Frey 207. 'Michelangelo for Porta Pia'.
   Thode 551. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 45, n. 1. 'Michelangelo for Porta Pia'.
6. Dussler 476. Casa Buonarotti 102A recto. Black chalk, ink, heightened with white. 468 × 279 cm.
   Dussler. 'Assistant's rendering for Porta Pia'.
   Frey 237. 'Assistant's rendering for Porta Pia'.
   Thode 157. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 45, n. 1. 'Assistant's rendering for Porta Pia'.
7. Dussler 296. Haarlem, Teyler Museum A29bis. Red chalk. 75 × 48 cm.
   Dussler. 'Attributed to Michelangelo; related to but not for Porta Pia.'
   Thode 264. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 42. 'Michelangelo, first sketch for Porta Pia.'
8. Dussler 134 verso. Casa Buonarotti 106A verso. Black chalk. 428 × 277 cm.
   Dussler. 'Michelangelo, window designs for Porta Pia; horse's head and hand for Capella Paolina'.
   Thode 70 verso. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 45, n. 2. 'Michelangelo for Porta Pia'.
9. Dussler 128. Casa Buonarotti 97A recto. Black chalk. 270 × 240 cm.
   Dussler. 'Michelangelo for Porta Pia'.
   Thode 152. 'Michelangelo for Porta Pia'.
   de Tolnai, p. 42, n. 2. 'Michelangelo for Porta Pia'.

Architectural Currents on the Mississippi River Frontier: Nauvoo, Illinois

ROBERT M. LILLIBRIDGE Chicago Land Clearance Commission

Since colonial days the United States has proved to be a congenial place for those seeking an opportunity to develop social and religious theories on virgin prairie soil. With the ever-present frontier, excellent lands and freedom to experiment were available for these groups. The long list of communitarian experiments in the United States, from Plockhoy's Commonwealth of 1663 at what is now Lewes, Delaware, to the Fourier Phalanx of 1858 in Dearborn County, Indiana, is ample evidence of the opportunity presented by the westward-receding frontier.[1]

Near the western boundary of the Northwest Territory three communitarian experiments were begun during the middle of the nineteenth century. Nauvoo, Illinois, was started in 1839, Bishop Hill, Illinois, in 1846, and Amana, Iowa, in 1855.

Of the three communities, Nauvoo probably represents the most typical architecture of the time. The converts to Joseph Smith came mainly from the northeastern portion of the republic, and since religious theory had not hardened but was characterized by continued revelations, they reflected the prevailing architectural modes from whence they migrated.

In 1846 when the exodus occurred, Nauvoo, as the largest city in Illinois, had an estimated population of 14,000 persons.[2] Today the town's estimated population is 1,250 persons with settlement mainly on the high land overlooking the flatland upon which the isolated architectural remnants of the original town now stand. But before the city, its structures, and plan are examined, the antecedents of the Saints need to be sketched.[3]

In the Greek Revival farm house of Peter Whitmer in the Town of Fayette, northern New York state, the Church of Jesus Christ of Latter-Day Saints was officially organized in 1830. As a prelude to that action, Joseph Smith had experienced a series of visions, had transcribed the Golden Tablets, and preached to numerous gatherings.

Successful preaching of the convert Sidney Rigdon in Kirtland, Ohio, propelled the group westward to that settlement. In 1833 the cornerstone of the Temple at Kirtland was laid, and in March 1836 it was dedicated. In general proportions the Temple was close to the established architectural precepts of its day. The pedimented structure carried a square tower superimposed by an octagonal cupola. The doorways and fenestration as well as other detailing reflected a curious mixture of Colonial and Federal elements together with a hint of Gothic in the pointed main windows.[4] This was definitely a product of a groping religious group which had not reached theological maturity and thus could not translate its message into a dynamic religious architecture.

The westward trek continued, in accord with Joseph Smith's revelation to found a new community of the Saints, until they reached the vicinity of Independence, Missouri. In Missouri friction soon became too great and forced a search for a more serene retreat. What was to have been a serene retreat, was dubbed Nauvoo as the Mormon rendition of the Hebrew phrase meaning 'a beautiful place'.

The Des Moines Rapids stretched twelve miles along the Mississippi River northward from Keokuk, Iowa, to the great bend in the river where Nauvoo was to be situated. Thus the flatland at the bend proved a strategic location for a town, as river commerce was shifted from boat to boat there before the canal on the Iowa side was constructed. When Joseph Smith bought acreage in 1839, the

1. Arthur Eugene Bestor, Jr., *Backward Utopias, The Sectarian and Owenite Phases of Communitarian Socialism in America* (Philadelphia, 1950), pp. 235–243.

2. Henry Caswall, *The City of the Mormons: or Three Days at Nauvoo in 1842* (London, 1842).

3. For Mormon history see Bernard DeVoto, *The Year of Decision, 1846* (Boston, 1943), pp. 69–101; and Will Griffith and Katherine Griffith, *Historic Nauvoo* (Peoria, Ill., 1941).

4. Rexford Newcomb, *Architecture of the Old Northwest Territory* (Chicago, 1950), p. 152.

Fig 1. Plat of the western or flatland portion of Nauvoo (from *An Illustrated Atlas of Hancock County, Illinois*, 1874).

village of Commerce (fig. 1) was located there with one stone house, three frame houses, and two block houses. On the farm land south of the town were located one stone house and three of logs. In the short span of six or seven years as a result of prodigious missionary efforts, the new town on this farm land was platted in gridiron pattern, and structures lined the streets.

The United Order was instituted early in the church organization to hold the property and the labor of the Saints in common. However, as formulated in the United Order, group efforts were not developed at Nauvoo because of the multiplicity of revelations and interminable conflict with neighbors. The one major group effort carried to completion in structural form was the Temple. It was located in a commanding position atop the hill which overlooked the flatland upon which the main portion of the town was situated (fig. 2).

The Temple cornerstone was laid on 6 April 1841, and the three-story limestone structure was completed in 1846, just as trouble with neighboring groups was becoming more prevalent. The building was on a grand scale with pilasters on all four sides and a four-section tower crowning the mass (fig. 3). Theological representations were reflected in the pilaster capitals with sun face and trumpets (fig. 4), the angel 'Moroni' trumpeting from the tower top,

Fig. 2. Nauvoo about 1847 (from H. Lewis, *Das Illustrirte Mississippithal*, [1857]).

and in the structure, by the twelve life-size stone oxen supporting the baptismal font. The Temple dimensions are as follows: 128 feet long, 88 feet wide, 60 feet high, and 200 feet to the top of the tower. In its dimensions and mass, and original and vigorous detail, the Temple fully reflected the theological concepts and missionary zeal of the church.[5]

The other existing group structure is the Nauvoo House (fig. 5) which, situated as it is on the water's edge, was intended to serve as the hotel when the Mansion House proved inadequate for the growing number of visitors to this metropolis. Nauvoo House, built of stone and brick, was begun in 1841 as a result of one of Joseph Smith's revelations. The Nauvoo House as it exists today, is the initial portion of a much larger structure which was to extend for 120 feet along both the street and river front. In 1846, at the time of the exodus, the foundation for the Nauvoo House extended its full length of 120 feet, and brick work was completed to the top of the second-floor windows. The building remained in that condition until 1869, when Lewis Bidamon, who married Joseph Smith's widow, demolished most of the structure for materials to use in completing the remaining southwest quarter. The timbers used in the Nauvoo House and in the Temple were felled in Wisconsin pine forests and brought by raft down the Mississippi.[6] Although the architectural composition of Nauvoo House is quite untraditional, and in

5. Graphic representations of the Temple vary sufficiently in details to make them a good field for study. It appears that the one illustrated in this article is somewhat idealized as to general proportions, and also with regard to tower and window details. In other respects it is close to the original as portrayed in a photograph at the Illinois State Historical Society.

6. H. W. Mills, 'De Tal Palo Tal Astilla', *Annual Publication, Historical Society of Southern California* x (1917), 95.

Fig. 3. The Nauvoo Temple, lithograph dated 1868 (photo: Harold Allen).

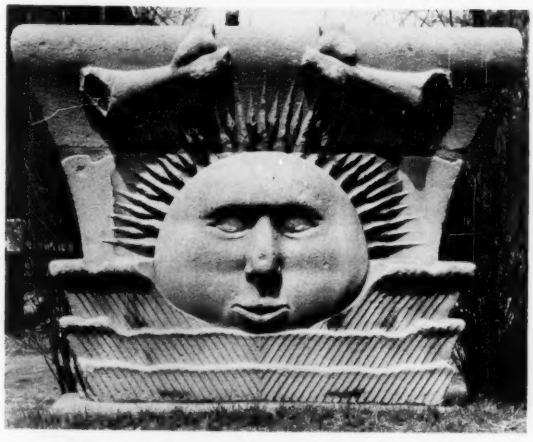

Fig. 4. Pilaster capital, Nauvoo Temple, now at Adams County Historical Society, Quincy, Illinois (photo: Harold Allen).

Fig. 5. The Nauvoo House, Nauvoo (photo: Harold Allen).

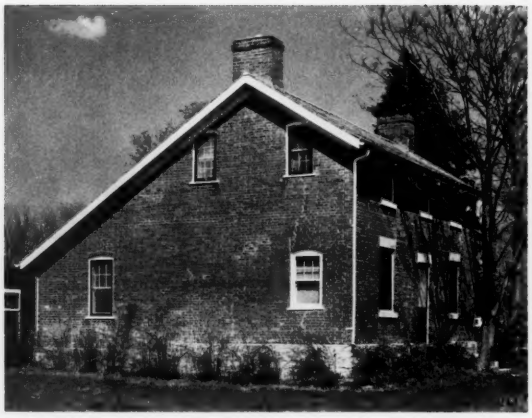

Fig. 7. William Marks House, Nauvoo (photo: Harold Allen).

Fig. 6. Brigham Young House, Nauvoo (photo: Harold Allen).

that respect complements the vigorous Temple design, architectural features such as the third-floor windows with overhead fan decor, and particularly the main door with transom and sidelights which is in that part of the structure completed prior to 1846, reflect the Federal architectural influence.

Several one-story brick residences of only two or three rooms are still in existence in the main portion of the old town. In their simple functional form, these probably represent the residential environment of the average settler. The architectural character of such houses is evident in the existing Brigham Young House (fig. 6), in both the one-story and two-story sections of the extended plan. The two-story section is of plain character except for the overtones of Dutch influence in the stepped end walls. The two-story section greatly resembles two other houses which are also probably typical residences of the average settler. These are the demolished Frank Paulin and Taylor residences, which were of brick, and without adornment except for the utilitarian limestone and brick-capped openings and prominent stepped end walls.[7]

The Jonathan Browning House and the William Marks House (fig. 7) in their general architectural character are typical of the more ordinary brick residences, although they are rather large. Both the Browning and Marks houses are of brick, two stories in height, and without architectural detailing except for brick- and limestone-capped openings. The Marks residence resembles a modified version of the yeoman proprietor house which was retained in Connecticut midst shifting architectural tastes.[8]

Many architectural design elements from the Colonial, Federal, and Greek Revival modes are evidenced in several of the more pretentious residential structures. These include the 1842 house of Wilford Woodruff (fig. 8), the 1845 house of Heber C. Kimball, and the John Taylor (Almon W. Babbitt) House of 1842. The Woodruff House with its first-floor plan typical of numerous Colonial houses, consisting of a central hall and two rooms on either side, presents an unaltered frontier version of an eastern architectural type. The end walls feature paired chimneys coupled by a parapet wall.

The Kimball House in its original two-story form, prior to the addition of the wing in 1867 together with the porch and other Victorian detailing, is closely akin to the Woodruff House. The main portion of the Kimball House also has paired chimneys coupled by parapet walls, and a simple doorway topped by a fanlight.

The John Taylor (Almon W. Babbitt) House in its two-and-one-half story brick mass, is one of the largest

7. Photographs of these demolished structures and several others are in the files of the Illinois State Historical Library.

8. Anthony N. B. Garvan, *Architecture and Town Planning in Colonial Connecticut* (New Haven, 1951), p. 127.

Fig. 8. Wilford Woodruff House, Nauvoo (photo: Harold Allen).

and architecturally most distinguished residences in Nauvoo (figs. 9 and 10). Not only the doorway with sidelights and transom, but also the entablature set with windows on the façade recall most clearly Greek Revival work prevalent throughout the country at this time. This structure has recently been restored with rather disastrous results to the window-lights, cornice, and curved stairway, but the general proportions and the intent of the original design fortunately are still fully evident. This residence was the central element in a three-structure group (fig. 10), which also included two two-story brick business buildings. The surviving business building was occupied by the John Taylor printing office where the official church paper, *The Times and Seasons*, was printed. That business building in its simple form, façade with limestone-capped openings, and fanlight in the pediment, is probably typical of the business structures in the prosperous days, prior to 1846.

One additional existing house should be mentioned before discussion of the residential focal point of the town. The Orson Hyde House provides the Nauvoo version of the wooden one-and-one-half story residential type frequently constructed in Ohio or New York. The Greek Revival elements are in full evidence complete with corner pilasters and windowed entablature. This is one of the few small wooden residential structures surviving in the town.

The Joseph Smith Mansion House (fig. 11), as the residential focal point of the town, received special architectural treatment with its façade broken into sections by four pilasters. The Federal doorway, with the usual sidelight and transom elements, is topped by a triple window and framed by columns in the late Federal manner akin to Greek Revival treatment. This structure was further refined with lead gutters and downspouts designed with eagle and star motifs. Construction of this building was

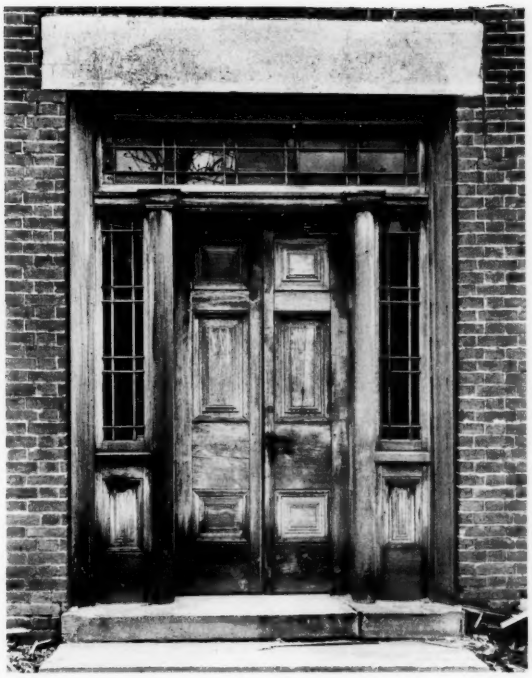

Fig. 9. Front door, John Taylor (Almon W. Babbitt) House, Nauvoo (photo: Harold Allen).

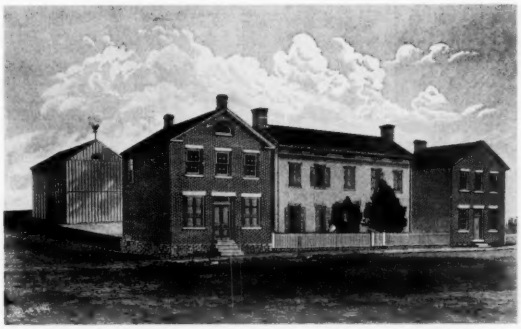

Fig. 10. John Taylor (Almon W. Babbitt) House and printing shop (left rear), Nauvoo (from B. H. Roberts, *The Life of John Taylor*).

started in 1842 and completed in August 1843.[9] The earlier Joseph Smith House (fig. 12) reflects the primitive life encountered by the Saints when they first settled on this flatland. The log structure with clapboard addition remains today, as a typical frontier residential structure not only for Nauvoo before its affluent period, but for the typical frontier settlement as well.

9. Historic American Building Survey, Northern Illinois, Project No. 26–24, narrative description.

Fig 11. Joseph Smith Mansion House, Nauvoo (photo: Harold Allen).

Fig. 12. Joseph Smith Homestead, Nauvoo (photo: Harold Allen).

The architectural character of Nauvoo was set by the Saints under Joseph Smith. To a lesser extent it was influenced later by the Icarian colony established by Étienne Cabet at the close of the Mormon era. The city plan established by plat to serve the burgeoning Mormon population, also has set the town character. In platting, the mundane gridiron block pattern of the average American city served as the example (fig. 1). Blocks with an east-west dimension of 398 feet, and a north-south dimension of 363 feet, were used throughout the town. Each block contained four lots. Street rights-of-way were designed to recognize their function, as Main Street was given a width of 82.5 feet, while all other streets were only 49.5 feet in width. Lots were a uniform area of 35,937 square feet, and thus were adequate for the usual garden and open space needed for each dwelling unit.

No areas were set aside for parks, or other civic purposes, with the exception of the one block on top of the hill used for the Temple. Only in reserving for public use the river frontage adjacent to the main part of the town, does Nauvoo presage city-planning concepts evidenced in the later development of Salt Lake City.

In this lack of concern for land-use organization within the town, and a disregard of the need for public open spaces, Nauvoo reflects the conditions of the American scene. In 1840, out of a total national population of some 17,069,000 persons, only 10.8 percent lived in urban areas. Open space to a predominantly rural population seemed forever present. But the one feature they universally presented in a central focal point of the town was the church or meeting house. The Temple in Nauvoo served to reflect the reason for, and unifying characteristic of, the theocratic organization.

From about 1820 to the Civil War, Greek Revival architectural design was practically the equivalent of a national style. The antecedents of the various builders also involved the earlier designs such as Colonial and Federal. But the intellectual elements of the times stressed the rise of the young republic and its affinity with Greek and Roman republican eras together with their architectural heritage. These architectural results were tempered likewise by the practicalities and vicissitudes of the frontier experience. Probably the most decisive influence on architectural design in the communitarian settlements was the intensity and duration of the group religious experience which caused rejection of prevailing society with its emphasis on architectural modes.

In the case of Nauvoo, the architectural response was close to that which might be expected in the prosperous frontier town that had passed beyond the log-cabin stage of development. Undoubtedly most of the houses were small and plain in design as evidenced in the central part of the Brigham Young House and kindred structures, and also in the William Marks House. In the Wilford Woodruff and Heber C. Kimball houses, the Colonial and Federal tradition in structural proportion and detailing was evidenced, and culminated in the Mansion House of Joseph Smith. In the John Taylor and Orson Hyde houses the Greek Revival elements were dominant, and yet they were used in a restrained manner, and without the exuberance found in the more established and affluent sections of the country. In Nauvoo, only the Temple combined a distinctive architectural mass and original details to reflect fully the unique amalgam of the Mormon religious approach.

AMERICAN NOTES

This is our tenth birthday and the forty-first issue of American Notes. We continue to welcome contributions, though our ability to correspond about them is still very limited.

Like all editors, we ride certain hobbies. They include the development of American building construction, materials and equipment, modern techniques of restoration, biographical notes on deceased architects, and documented contributions to our knowledge of buildings north of Mexico, but including the West Indies.

In these pages we give most of our attention to those who have uncovered new facts through their diligent labor, and have arranged them conveniently for the instruction and use of others. American architecture is creating history faster than it is being discovered and reported.

—Ed.

Latrobe on Architects' Fees, 1798

The size of professional fees has always been a lively question and Benjamin Henry Latrobe, our first modern architect, was pioneering. The letter below is published for the first time from the original in the Virginia State Library, Richmond. Another letter discussing this subject—written to Robert Mills in 1806—may be found in the appendix to Talbot Hamlin's *Benjamin Henry Latrobe* (New York, 1955), pp. 585–591.

The Penitentiary House referred to was authorized by the Virginia General Assembly in 1796 under Thomas Jefferson's influence. Construction from Latrobe's plans began the following year under the direction of Major Thomas Callis. The site overlooked the James River just above what is now the Richmond business center. Latrobe was busy at the time planning the more spectacular Philadelphia waterworks and the Bank of Pennsylvania, and his connection with the Richmond penitentiary was to end in 1799. The latter was ready in 1800 and was used continuously until demolition in 1928. The institution, much enlarged in size, continues on the same site.[1]

—Ed.

1. This information is taken from William H. Gaines, Jr., 'The Penitentiary House', *Virginia Cavalcade* VI, no. 1 (Summer 1956), 11–17. This able article does not discuss the architecture of this remarkable building in depth.

Richmond Febr 14th 1798.

[Addressee not given]

In complying with the desire of the Executive expressed to me by you in September 1797, by herewith submitting my charge for professional Services at the Penitentiary house,[2] I have been unwilling to accompany it with any observations, lest I should appear to doubt either the liberality of the Executive, or the fairness of my bill.—As however both the employment of an architect and its concomitant expense appear to be new to the public Works of this State, and some question may arise relative to it,—I take the liberty to trouble you with the following explanatory remarks, leaving it to your discretion whether or no they ought to be respectfully submitted by me to the Executive.

It is in France, Germany & England the established custom of Architects, (in England confirmed by many decisions of the Courts) to charge for their works, 1., a commission of 5 prCent on the whole amount of the expence incurred in executing their design,—2., a certain sum for fair drawings, if furnished, according to their difficulty, number, or beauty;—3., if the work be at a distance from the usual residence of the Architect,—all travelling expences, & a certain sum pr day for loss of time. All the English architects of eminence charged in 1795, five Guineas pr day, and no surveyor or measurer less than one Guinea. If surveys, reports, or agreements are drawn, these are separately charged.—If drawings & descriptions alone are made, without further direction of the work, either personally or by letter,—2 ½ prCent *upon the Estimate* is charged, whether the work be executed or not. This latter charge is established by several decisions of the Courts.

2. Latrobe won the commission for the Virginia penitentiary in a competition at Richmond in 1797, Hamlin, *Latrobe*, pp. 120–126. See also 'American Notes', *JSAH* XII (December 1953).

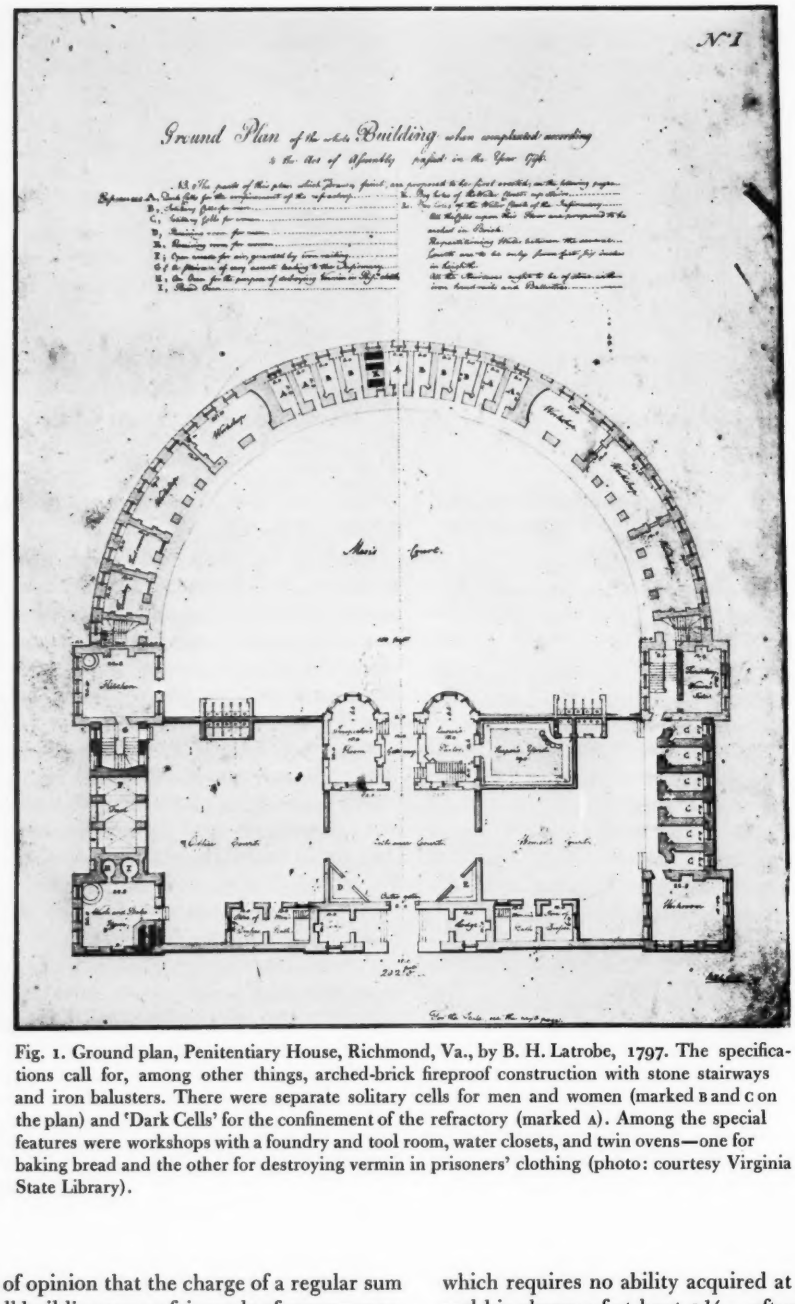

Fig. 1. Ground plan, Penitentiary House, Richmond, Va., by B. H. Latrobe, 1797. The specifications call for, among other things, arched-brick fireproof construction with stone stairways and iron balusters. There were separate solitary cells for men and women (marked B and C on the plan) and 'Dark Cells' for the confinement of the refractory (marked A). Among the special features were workshops with a foundry and tool room, water closets, and twin ovens—one for baking bread and the other for destroying vermin in prisoners' clothing (photo: courtesy Virginia State Library).

I never was of opinion that the charge of a regular sum prCent upon all buildings was a fair mode of recompence. Upon very small works of taste it is much too little, upon very extensive ones, it is often too much. It is however difficult to contrive any other more eligible method, and compared with the charge of merchants for their negotiations, it is in all instances very reasonable. In an hour a merchant can by means of a Clerk execute a commission which requires no ability acquired at a great expence,—and his charge of at least 2½,—often of 5 prCent is admitted without dispute. To execute a commission to no larger an amount, an architect or engineer must perhaps attend in all weathers for many months, & his charge is no greater. The talents necessary to his profession are rare, & a more expensive education is requisite to none. His services however if honestly applied, are of the utmost

importance to his employers, & independent of the utility & convenience of his works, it is in his power to save much more than any reasonable recompence can amount to.

It may be said, that the customs of the old countries ought not to govern the practices of this State. Admitting the justness of the observation, I beg leave to compare my charge to one actually paid to a professional man employed in this city.—Mr. Weston came from Philadelphia to Richmond,[3] being sent for by the James river company to give designs for the completion of their Navigation. He staid not more than eight days, & left drawings,—plans & profils [*sic*], of eight locks, with the necessary descriptions & estimates. His bill at the tavern, & his travelling charges were paid, besides his account for professional services.—In all they amounted to 1.200 Dollars. From Richmond he went to Petersburg, expecting to meet the Appomattox Superintendants. He was disappointed and returned the same day. I was present when his bill of 50 Dollars, and 13 or 15 Dollars for expences was ordered to be paid, at the meeting of the Company at Chinquapin Church.

It would be hypocrisy in me to say that either my experience, or my opportunities of acquiring professional knowledge were less than his, & his testimony in my favor renders comparison unnecessary.—

I will now mention only one more circumstance which affects me personally. When my plan was so honorably to me both in the manner and in the gratuity accompanying it adopted by the Executive, I was engaged by the old Dismal Swamp Company to make a survey of all their Land in the Swamp,—to cut a compleat Lane round it,—and to lay off canals for the supply of Jericho & Smiths Mills. I had been residing a fortnight at Suffolk, from whence I visited and ascertained the situation of the West side of the Swamp & the Lake, and had staid another fortnight at Norfolk, where at the expence of the Company I was furnished with the necessary conveniences for exploring the whole Swamp, in which it was calculated I should encamp about 3 weeks, without being able to command any assistance or food, but what I carried with me. All the expence attending these preparations was incurred, when I received Your letter informing me that my attendance at Richmond would be required to survey the situation & set out the building of the Penitentiary house. Mr. McCaulay the President of the Company delivered me the letter, & consented to the postponement of the intended expedition. I was under the necessity of staying a few days longer at Norfolk, & of returning to Richmond *at my own expence*. It was however impossible for me afterwards to resume my operations, & the Company took my bond for 120 Dollars (which was about the amount of their expences) payable on the 1st of May 1798 in case I should not proceed in their business. This bond will, I presume,—at all events be forfeited.

The sum expended under my direction is about 15.000 Dollars. On this I have charged 5 prCent including all my expences, and every other possible charge, & I have no doubt but that it will appear to the board that it has been my intention to charge as moderately as possible, and my books will prove that I have charged less than I ever did before. Should the Executive still employ me, it is my earnest wish to have a fixed Salary,—the amount of which, were I permitted to name it, would be not more than at the rate of 2 ½ prCent on the money likely to be expended at the Penitentiary house in the course of the present year, and I would then consider myself as bound to give my professional assistance to the Executive in *every public* Work at *Richmond*.—

I am with great esteem & sincerity

Yrs

B. Henry Latrobe

3. Probably this was William Weston, the English hydraulic engineer who supervised the famous caisson work of the Market Street Permanent Bridge in Philadelphia (built 1798–1804). See *Philadelphia Architecture in the Nineteenth Century*, ed. Theo. B. White (1953), p. 22.

Early Brass-cased Rim Locks

ROBERT T. TRUMP

Robert Trump of Flourtown, Pa., collector of, and dealer in, antique hardware and woodwork, is one of the pioneer restorationists on Society Hill, Philadelphia.

While we have seen interesting collections of box locks, brass cases are uncommon in this country before 1800 and very little seems to have been written about them. The tendency in restoration is to use too many because they are bright and attractive.

The Park Service has found documentary references to 'brass nob lock's, bought for Independence Hall in the 1750s from Hugh Roberts of Philadelphia (not to be found in the building now). Actual specimens were found by architect Judd in both the Philip Schuyler Houses—'The Pastures' (Albany, 1762) and the frame house at Schuylerville (1777, improved ca. 1786, and now being restored). Presumably these were bought by Schuyler in England. —Ed.

Most of the door hardware used in the American colonies was made in England, because the mother country had ruled that our raw materials be sent for manufacture to Britain, where industry was already well established. Therefore, most of the eighteenth- and early nineteenth-century brass-cased rim locks were imported. The great lock centers were at Wolverhampton, Willenhall, and Bilston, where the English took great pride in their craftsmanship and were the leading producers in the world for many years.[1] In fact, there was such great confidence in

1. Willenhall Urban District Council, *A History of Willenhall—Tildesley* (1951), p. 139.

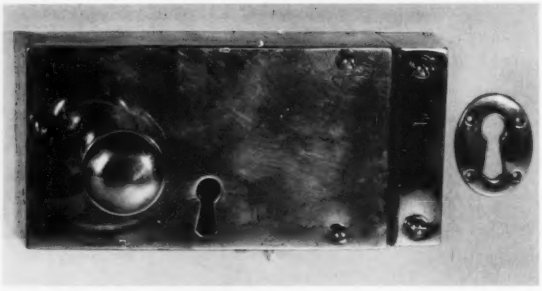

Fig. 1. Brass box lock. Eight-inch exposed-screw type. Eighteenth century.

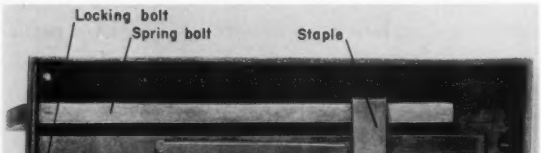

Fig. 2. Brass box lock (reverse).

door hardware from England, that for some time after the Revolution and well into the nineteenth century most Americans continued to secure it from there.

Previously the mechanisms or working parts of the early locks had been left exposed to the eye, but in the latter part of the seventeenth century it became the style to enclose them in a box or casing, which prevented dust from affecting the operation of the lock. A sheet-iron box was used frequently to enclose rim locks, but when used on the finer houses the case was quite often made of brass. The works themselves continued to be made of iron during the eighteenth and early nineteenth centuries. Brass works came much later in the nineteenth century.

Many of the 'common steel' or plain iron rim locks frequently were used in the Colonies on the better early buildings,[2] owing to the fact (especially in American country houses) that even our best buildings were less sophisticated than their English prototypes.

The rim lock as we know it really started to develop in England with the Baroque architecture of the second half of the seventeenth century. It revealed a decided French influence but retained several traditional English characteristics. The influence of the great French Huguenot ironwork designer, Daniel Marot, is apparent in some of the more significant early locks.[3]

Rim locks became plainer in character by the end of the first quarter of the eighteenth century and were being turned out in large quantities by child labor. The making of locks had declined from a proud craft to a flourishing industry, very little individuality being apparent in examples from then on. Parts were nearly interchangeable and the quality became quite uniform.

A yellow-colored brass was used for the lock casings and it added a welcoming color to a door when kept brightly polished. As to the interior of the lock, the spring bolt was at the top and was operated by the turning of the knob cam which worked this bolt. Below the spring bolt was the dead bolt, which was thrown back when the key was inserted and turned past the wards in the lock. In the lowest part of the lock was the night bolt or private bolt, which on early locks had a small knob on the lock face which merely turned it into place.[4] On locks made after about 1740 a slide was simply pressed along the bottom of the lock which pushed the private bolt over.

The knobs were of brass and were either oval or round in shape, the oval ones having been used generally earlier in this country. Drop handles were also used with elegant effect.

While the locks were encased in brass, with brass accessories, only wrought-iron keys were used, brass keys not being made until much later. Some of the locks did not have a keyhole on the interior or lock side of the door (especially the moulded edge examples which were used on our most elegant houses)[5] because the private bolt locked it when the room was in use, and the keyhole on the outside of the door was used only when entering or leaving.

Locks were made right-facing and left-facing, depending on which side the door opened. Often when the lock preferred was right-facing, and only a left-facing one was

2. For example: Cliveden, Germantown, Pa., and Woodlawn Plantation, Mount Vernon, Virginia.

3. Sacheverell Sitwell, *British Architects and Craftsmen*, 3rd ed. (London, 1947), pp. 60, 75.

4. The earliest brass-cased locks on George Washington's Mount Vernon date from about 1730.

5. For example, the Stamper-Blackwell House from Society Hill, Philadelphia. A paneled parlor is now at the Henry Francis du Pont Winterthur Museum.

available, it was put on upside down—even on some of our finest old buildings.[6] They functioned just as well either way.

A fine old brass lock, while serving a practical purpose, can also be decorative. It is surprising how one can change and improve the character of a door, and even the surrounding area, when a lock is applied with complete authenticity.

6. The carriage entrance doors both at Mount Vernon and at Woodlawn Plantation are equipped that way.

Ammi B. Young in the Connecticut Valley

OSMUND R. OVERBY

The middle Connecticut River Valley was one of the areas selected by the National Park Service to be recorded by the Historic American Buildings Survey during the summer of 1959. A team with headquarters at Dartmouth College, Hanover, under the sponsorship of Hugh Morrison, recorded seven buildings with which the architect Ammi B. Young was associated. These include churches in Norwich, Vermont, and Lebanon, New Hampshire, four buildings at Dartmouth College, and the Windsor, Vermont, Courthouse and Post Office building.

The literature on Young seems to be very limited; an outline of his career may be found in Talbot Hamlin, *Greek Revival Architecture in America* (New York, 1944). Hamlin comments that Young 'is one of many brilliant architects whose careers cry out for more careful research.' Mr. Overby, who worked on the Hanover team with Henry C. Edwards—and is now with the National Park Service in Philadelphia—offers these notes as a starter. —Ed.

Baker Library at Dartmouth College maintains a file of notes on Young gathered by various students in connection with studies of Dartmouth buildings. According to these notes, Ammi Burnham Young was born in the neighboring town of Lebanon, New Hampshire, 19 June 1798, the son of Rebecca nee Burnham and Samuel Young. No record was found that he attended college or received any advanced formal education, but he did receive two honorary M.A. degrees, from the University of Vermont in 1839 and from Dartmouth in 1841. Young was active in his home-town area at least until the late 30s, when his fame had spread wide enough to earn him the important commissions for the Vermont Capitol in Montpelier (completed by 1838),[1] and the Boston Custom House (1837–1847) with Isaiah Rogers.[2] During the 40s Young was probably in Boston or Washington, but apart from the Custom House and the Worcester Courthouse little seems to be known of his work at this time.[3]

From 29 September 1852, Young was Supervising Architect of the Office of Construction of the Treasury Department in Washington.[4] This was a period of growing building activity for the Department, and Alexander H. Bowman, Corps of Engineers, was 'In Charge of the Office of Construction'[5] to centralize control and establish uniform methods of operation. Under Bowman, the Office concentrated architectural responsibility on its own staff rather than giving commissions to local architects. In 1855 and 1856 lithographed drawings showing plans, elevations, sections, and details of their projects were distributed widely by the Treasury Department (figs. 5–8).[6] The prominent credit given Young as architect on these draw-

1. Public Act 30, Section 3, *Acts and Resolves passed by the Legislature of the State of Vermont at their October Session, 1837* (Montpelier, 1837), pp. 18, 19, provided $3,500 for 'completing the State House . . .'.

Joint Resolution No. 39, *Acts and Resolves passed by the Legislature of the State of Vermont at their October Session, 1838* (Montpelier, 1838), p. 24, expressed official thanks to Young:

Resolved, The Senate concurring herein, That the thanks of this Legislature be presented to Ammi B. Young, Esquire, as a testimonial of their approbation of the taste, ability, fidelity and perseverance, which he has manifested in the design and execution of the new capitol of this state; which will abide as a lasting monument of the talents and tastes of Mr. Young as an Architect.

Resolved, That the foregoing resolution be signed by his excellency the Governor, countersigned by the Secretary of State, with the Seal of the state, and presented to Mr. Young.

2. See Talbot Hamlin, *Greek Revival Architecture in America* (New York, 1944), p. 106.

3. Hamlin, *Greek Revival*, pp. 106–111, suggests Young might have done other work in Boston at this time. Edwin Bateman Morris, 'Ammi B. Young', *Journal of the American Institute of Architects*, New Series, I (1944), 68–71, indicates that he was already active in the Treasury Department in Washington.

4. Morris, 'Ammi B. Young', p. 70. For the history of the Office of Supervising Architect, see: George N. Lamphere, *The United States Government; its Organization and Practical Workings* (Philadelphia, 1881), pp. 92–95; R. H. Thayer, *History, Organization and Function of the Office of the Supervising Architect of the Treasury Department* (Washington, 1886), Treasury Dept. Doc. No. 817; Darrell Hevenor Smith, *The Office of the Supervising Architect of the Treasury; its History, Activities and Organization* (Balitmore, 1923), Institute for Government Research, Service Monographs of the U. S. Government, No. 23; and *A History of Public Buildings under the Control of the Treasury Department* (Washington: Government Printing Office, 1901).

5. Bowman's title as it appears on drawings and official reports.

6. This extensive series of folios appeared under the title, *Plans of Public Buildings in Course of Construction for the United States of America under the direction of The Secretary of the Treasury*, and was dated 1855 or 1856. On this publication and its distribution, see Hamlin, *Greek Revival*, pp. 110–111.

Fig. 1. Thornton Hall, Dartmouth College, 1828. Similar to Wentworth Hall except for the location of entrances (photo: Dartmouth College Photographic Bureau for HABS).

Fig. 2. Reed Hall, Dartmouth College, 1839 (photo: Dartmouth College Photographic Bureau for HABS).

ings and the small size of his architectural staff indicate,[7] as was customary at the time, that Young was personally responsible for the designs.

Young retired 24 July 1862, and lived in Washington until he died 14 March 1874.[8]

Norwich and Lebanon Churches

Of the two churches in the Connecticut Valley given to Young, the Norwich, Vermont, attribution seems doubtful.[9] The church was built during the summer of 1817 and dedicated 20 November 1817,[10] when Young was only nineteen years old. At any rate, this regionally typical building cannot represent anything very personally Young's. The Congregational Church on the Green in Young's home town of Lebanon is locally attributed to him.[11] The HABS team did not examine the building in detail, but only indexed it. When the church was disestablished in 1820, the town retained ownership of the earlier meetinghouse, and the church built its own, the present building, in 1828.

Dartmouth College Buildings

Young's authorship of four Dartmouth buildings is established by documents preserved at the college.[12] In 1827 Young was selected as architect for the twin buildings, Wentworth and Thornton Halls (fig. 1).[13] These buildings, completed in 1828, are nearly identical, the main difference being in the location of the entrance doors. The interiors have been rebuilt several times, but the exteriors preserve their original forms. They are brick buildings on stone foundations, fifty by seventy feet, three stories high with gabled roofs. With their plain wall surfaces and regular fenestration patterns, they present a typically collegiate, early nineteenth-century appearance. They are named for early benefactors of the college, John Thornton and a Governor of New Hampshire, John Wentworth.

Young's next Dartmouth building was Reed Hall (fig. 2),[14] built in 1839 through a bequest of William E. Reed of Marblehead, Massachusetts. On this project, a brother, Ira Young, Dartmouth professor of astronomy and natural philosophy, served as construction overseer for the college, and a third brother, Dyer H. Young, was the builder. As part of a complex including the two earlier buildings, Reed Hall is similar to them in size and construction. It shows Young's developing interest in the Greek Revival, for he uses corner pilasters and graduated window sizes.

7. In 1856 for example, the office consisted of one engineer in charge, one supervising architect, one clerk, six draftsmen, and one computer and draftsman. Smith, *The Office of the Supervising Architect*, p. 5.

8. Morris, 'Ammi B. Young', pp. 70–71, quotes the following obituary from the *Evening Star*, Washington, D. C., 14 March 1874: 'He was one of the most faithful and upright of public officers, and his administration of public affairs was marked by ability and the strictest integrity.'

9. A local tradition attributes the church to Young. See also, Hamlin, *Greek Revival*, p. 106.

10. Philip Aylwin White and Dana Doane Johnson, *Early Houses of Norwich, Vermont*, ed. Hugh S. Morrison (Hanover, New Hampshire, 1938), pp. 38–39.

11. *The Lebanonian* 1, no. 8 (Lebanon, New Hampshire, July 1898), pp. 7, 10. The frame was raised 24 April 1828, the building dedicated 13 August 1828. Total cost $3,162.00.

12. These documents form the basis of the student papers on the histories of these buildings cited below.

13. R. L. Kenney, 'The History of Wentworth and Thornton Halls' (student thesis in Carpenter Library, Dartmouth College, 1935).

14. Roger P. Benezet, 'The History of Reed Hall' (student thesis in Carpenter Library, Dartmouth College, 1932).

Fig. 3. Shattuck Observatory (showing original dome), Dartmouth College, 1854 (photo: Dartmouth College Photographic Bureau for HABS).

Young's final work at Dartmouth was the Shattuck Observatory built in 1854 (fig. 3).[15] This building was made possible through a gift from Dr. George C. Shattuck, Dartmouth class of 1803, which stipulated that Young was to design the building and that his brother, Professor Ira Young, was to supervise the project. It is a simple brick building with three one-story wings projecting from a domed, two-story, circular center. The original wood-framed, metal-clad, revolving dome has been recently replaced; otherwise the building has not been essentially altered. Built at a time when he was deeply involved in the prevailing revivalism as Supervising Architect of the Treasury, this building shows a strikingly frank and direct manner which serves to remind one of Young's versatile talents and capabilities.

Windsor Courthouse and Post Office

The Courthouse and Post Office in Windsor, Vermont (fig. 4), recorded by photographs for HABS, is typical of Young's work as Supervising Architect. The building was included in the Treasury Department's publication of plans (figs. 5–8), and a set of these lithographed drawings for the Windsor Courthouse and Post Office is preserved in the building. The drawings are dated 1856 and the progress of the building can be traced through Bowman's annual reports to Congress in 1857, '58, and '59 when he reported the building completed and in use.[16]

15. Wendell H. Williams, 'The Architectural History of the Observatory' (student thesis in Carpenter Library, Dartmouth College, 1934).

16. A. H. Bowman, 'Report of the Engineer in Charge of the Office of Construction, under the Treasury Department, September 30, 1857', Statement No. 12 in *Report of the Secretary of the Treasury on the State of the Finances for the Year ending June 30, 1857* (Washington, 1857), First Session, Thirty-fifth Congress, Senate Ex. Doc. No. 1, pp. 90–137 [hereafter, 'Report, 1857']. 'The building being erected for a post office and United States court room, at Windsor, was commenced late in the past season. The cellar is excavated, the cellar walls and partition walls up to the level for the course of cut stone, which course is laid. This building can easily be finished next season.'

Fig. 4. Courthouse and Post Office, Windsor, built 1856–1859 (photo: Aubrey P. Janion for HABS).

Fig. 5. Courthouse and Post Office, Windsor, cover sheet of lithographed drawings of 1856 (photo: HABS).

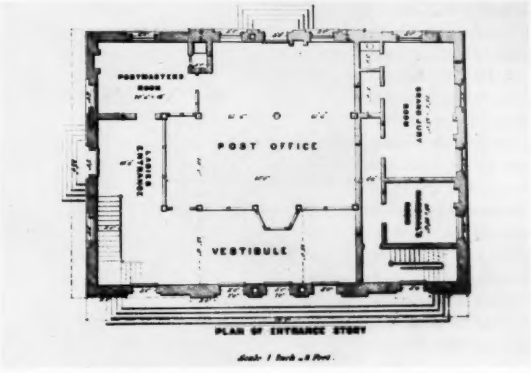

Fig. 6. First floor plan, Courthouse and Post Office, Windsor (photo: HABS).

Fig. 7. Front or west elevation, Courthouse and Post Office, Windsor (photo: HABS).

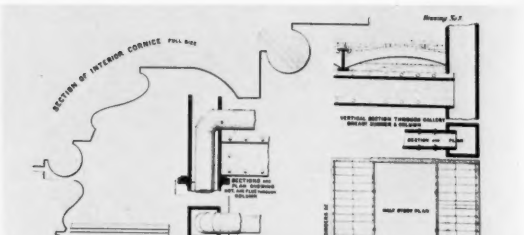

Fig. 8. Details of the Courthouse and Post Office, Windsor. These structural and ornamental details are typical of Young's Treasury Department work (photo: HABS).

This was a period of intense activity for the Office of Construction with over eighty buildings in progress including customhouses, courthouses, post offices, marine hospitals, mints, and various other types of buildings.[17] To handle this volume, the work was standardized both in design and construction, and a courthouse and post office was built from identical plans at the same time in Rutland, Vermont. The Windsor building is typical in its use of iron which the Office of Construction was energetically promoting. This was a consideration in the Treasury's publication of public building plans as indicated by the letter of gift that accompanied the drawings.[18] Bowman's annual reports during the period of construction of the Windsor building also indicate a growing confidence in the practicality and versatility of iron as a building material.[19]

Windsor's stable population and the generous design of the Courthouse and Post Office have allowed the building to continue in use without alterations or additions.

A. H. Bowman, 'Report of the Engineer in Charge of the Office of Construction, under the Treasury Department, September 30, 1858', Statement No. 10 in *Report of the Secretary of the Treasury on the State of the Finances for the Year ending June 30, 1858* (Washington, 1858), Second Session, Thirty-fifth Congress, House Ex. Doc. No. 3, pp. 87–130 [hereafter, 'Report, 1858']. 'The court-house and post office at Windsor, Vermont, will probably be completed the present year. All the brick walls are built, and, with but few exceptions, the iron work all in place. The plastering of walls and ceiling is nearly finished. The floors will be laid, and the carpentry put in place as soon as the walls are sufficiently dried . . .'.

A. H. Bowman, 'Report of the Engineer in Charge of the Office of Construction, under the Treasury Department, September 30, 1859', Statement No. 13 in *Report of the Secretary of the Treasury on the State of the Finances for the Year ending June 30, 1860* (Washington, 1860), First Session, Thirty-sixth Congress, Senate Ex. Doc. No. 3, pp. 91–138 [hereafter, 'Report, 1859']. 'The new courthouses and post offices at Rutland and at Windsor, Vermont, . . . are both completed, furnished, and occupied by the postmaster of each place, and the court-rooms are ready for use whenever the courts shall be held . . .'. From Table 8, 'Windsor: Total appropriation, $76,000.00; Purchase of site, January 20, 1857; Cost of site, $4,500.00; Date of contract, March 19, 1857; Contract time of completion, July 1, 1858; Actual time of completion, March 25, 1859; Contract price of construction, $49,300.00; Total cost, $68,262.48.'

17. Bowman, 'Report, 1857', 'Report, 1858', 'Report, 1859'.

18. Hamlin, *Greek Revival*, pp. 110–111, quotes this letter in part.

19. Bowman, 'Report, 1857', p. 92. 'The advantages of using iron for all purposes to which it is applicable in our public buildings, after nearly five years' experience, are fully demonstrated. The principal iron establishments in our large cities and towns have made themselves fully acquainted with the details of construction in iron, as applied to building purposes, and have provided themselves with machinery, tools, etc. for executing work promptly, and at such reduced rates as almost to bring it in competition in price with stone, brick, and wood. Where much ornament is aimed at, it can be erected in iron cheaper than in stone.'

Bowman, 'Report, 1858', p. 89. '. . . the enormous consumption of iron by the government is materially promoting the general welfare of the great interest involved in its production.'

Bowman, 'Report, 1859', p. 93. 'I have the honor again to call your attention to the growing variety of uses for which iron is most desirable in public buildings. Every new trial suggests new uses, and the opportunity thus given to stimulate the production of this national staple, with both present and ultimate economy to the government, will not be neglected when the finances of the country shall again permit me to call your attention to the new works already authorized.'

Except for the jail in the basement, which is unused, the building continues to serve its original purposes adequately, and survives as an attractive example of public architecture of a century ago. Henry Russell Hitchcock comments that the standards of design and construction maintained by Young and Bowman were their inheritance from Young's predecessor, Robert Mills.[20] By the 1850s this heritage had been modified by the prevailing Italianate manner distinguishing Young's work as Supervising Architect from both Mills' and his own earlier Greek Revivalism.[21]

20. Henry Russell Hitchcock, *Architecture; Nineteenth and Twentieth Centuries* (Baltimore, 1958), p. 81.

21. Hitchcock, *Architecture; Nineteenth and Twentieth Centuries*, p. 89.

The Hoo Hoo House Alaska-Yukon-Pacific Exposition, Seattle, 1909

JAMES F. O'GORMAN

Mr. O'Gorman discovered this interesting example of Northwest architecture while at the University of Washington, Seattle. At the present time he is a graduate student in architecture at the University of Illinois and has been working summers with the National Park Service in an intensive study of certain eighteenth-century buildings in Philadelphia. —Ed.

The clubhouse designed by architect Ellsworth Prime Storey (b. 1879)[1] for the Hoo Hoo, a national lumberman's fraternity, and erected at Seattle's Alaska-Yukon-Pacific Exposition of 1909, was demolished in April 1959. At the close of the fair it had become the property of the University of Washington, and functioned as a faculty club until its destruction. Its disappearance is unfortunate. The Hoo Hoo House was a product of architectural individualism, but recalled the mid-nineteenth-century Stick Style and reflected the more contemporary thought of the Chicago 'prairie architects'. An interesting example of the westward diffusion of these movements, it was a forerunner of later Seattle architecture.

The privately commissioned Hoo Hoo House was not typical of the exposition's architecture. The official buildings, designed under the supervision of John Galen Howard (1864–1931),[2] were of an academic unity which reflected the Chicago Fair of 1893. The Hoo Hoo House, on the other hand, was an individual architectural statement, and in that sense recalls Louis Sullivan's Transportation Building at the earlier fair. As with the latter building,

1. The author is indebted to Ellsworth Storey of Ithaca, New York, and to Victor Steinbrueck of Seattle, for much information used here. Professor Steinbrueck's *A Guide to Seattle Architecture 1850–1953* (New York, 1953) first called attention to Storey's work, and remains the only survey of Seattle architecture. Since writing this article the author was sorry to learn of Mr. Storey's death on 28 May 1960.

2. 'Our Exposition in Seattle', *Architectural Record* XXVI (July 1909), 24.

Fig. 1. Exterior from the west, Hoo Hoo House, Alaska-Yukon-Pacific Exposition, by Ellsworth Storey, 1909 (photo: Wayne Andrews).

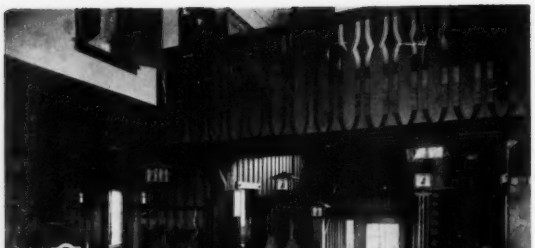

Fig. 2. Interior, Hoo Hoo House. View from assembly hall toward the entry (contemporary photo by F. H. Nowell, courtesy of Victor Steinbrueck).

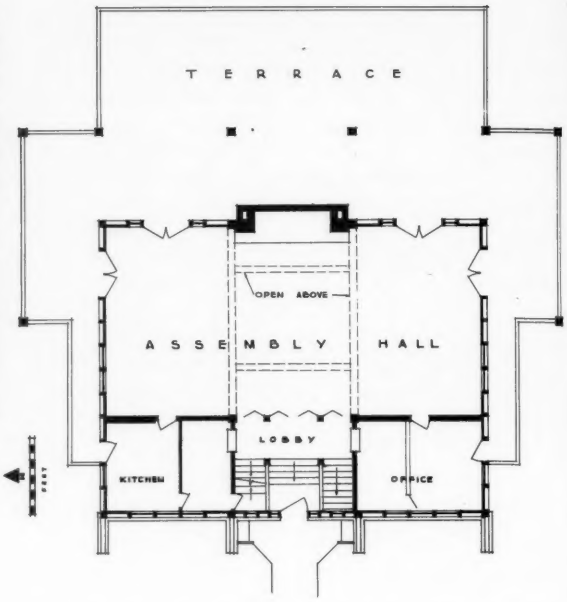

Fig. 3. First floor plan, Hoo Hoo House (redrawn by author from the architect's working drawings, including additions made during construction—terrace partly conjectural).

Storey's work received contemporary praise for those qualities which set it apart from most of the exposition's architecture.[3]

A survival of many features from the mid-nineteenth-century Stick and Shingle Styles[4] characterizes much of Seattle's twentieth-century domestic architecture. In this area, with its vast timber resources, wood continues to be the most abundant building material. The domestically scaled Hoo Hoo House, intended as a display of forest products, recalled the Stick Style by its exposed timber frame, here employed as the actual wall structure. This dark-stained timberwork, contrasting with the stucco panels, created a visually active exterior (fig. 1).[5] Other Stick Style features, for example the use of vertical board and batten siding, were also found in the building.

In addition, the Hoo Hoo House was closely linked to a more contemporary movement: the 'New School of the Middle West', as Frank Lloyd Wright called it (1908); that is, the early work of the 'prairie architects', and the coeval Chicago Arts and Crafts Society.[6] Ellsworth Storey, who moved to Seattle in 1903, was born in Chicago. He graduated from the University of Illinois (B.S. in architecture 1903), and while a student worked during the summers (1901, 1902) with the Chicago firm of Frost and Granger.[7] There is no doubt that he was aware of the work of the group about Wright. In the Hoo Hoo House the characteristic picturesque asymmetry of the Stick Style had disappeared. The massing was reminiscent of Sullivan's West Chicago Club (1886): the use of a central, projecting, and gabled bay above the entrance was common to both. However, the verticality of the taller Sullivan building gave way in the Hoo Hoo House to a dominant horizontal character reflecting the contemporary prairie house. On the interior, the central, two-story void of the wide assembly hall (twenty-five by fifty feet), used in conjunction with areas of varying but more restricted size,

3. 'The Hoo Hoo House at the A.-Y.-P. Exposition', *Pacific Builder and Engineer*, Seattle (12 June 1909), 234–236. This article contains a complete description of the building, but the accompanying plans should be used with caution. They were apparently taken from the architect's preliminary drawings rather than the executed building and are not correct.

4. Vincent J. Scully, Jr., 'Romantic Rationalism and the Expression of Structure in Wood. Downing, Wheeler, Gardner, and the "Stick Style", 1840–1876', *Art Bulletin* XXXV (1953), 121–142; Scully, *The Shingle Style* (New Haven, 1955). Other examples of Storey's work bear choser affinity to the latter.

5. Storey's work can be profitably compared as well to the California work of Bernard Maybeck and others: for instance, the residence by Maybeck at 3500 Jackson St., San Francisco (1909 and later).

6. H. Allen Brooks, Jr., 'The Early Work of the Prairie Architects', *JSAH* XIX (March 1960), 2–10.

7. Charles Sumner Frost (1856–1931) and Alfred Hoyt Granger (1867–1939), although never listed among the 'prairie architects', did produce some work exhibiting regional characteristics. See Harry W. Desmond, 'The Work of Frost and Granger', *Architectural Record* XVIII (August 1905), 114. An even stronger link between these two areas was forged when Andrew Willatsen, one of Wright's draftsmen at the Studio, moved to Seattle sometime before 1909.

recalls Wright's use of the same interior spatial organization. In addition, Storey's association with the spirit of the Arts and Crafts movement is apparent from the fact that he designed all the building's furniture and many of its appointments (fig. 2).[8]

In contrast to the derivative stylistic features listed above, the terrace to the east exploited the building's splendid location. It was situated on a typical Seattle sloping site at the top of a ridge overlooking Lake Washington. The elevated platform off the assembly hall provided a view of the lake and Mt. Rainier beyond (fig. 3).[9] In features such as this the building foretold of later Seattle architecture: some type of exterior viewing area, or 'deck', is now a typical feature of Seattle building.

Any study of Seattle's twentieth-century architecture will have to consider the influence of the Hoo Hoo House, as well as other early works by Ellsworth Storey.[10] Until its destruction, this building stood in a pivotal position in Seattle architecture, demonstrating the adaptation of established styles to a new environment.

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8. There is a remarkable similarity between this interior and the work of the architects Parker and Unwin of the English Arts and Crafts group.

9. The terrace was closed in and slightly altered at an undetermined date, probably when the building was converted into a faculty club. Also removed, and probably at this time, were the rearing cat figures which flanked the entrance and crowned the gables. These figures, which show in early photographs, were fraternal symbols.

10. The concentration of interest on California architecture has allowed the remainder of the coast to go unexplored. Both Seattle architecture in general, and Storey's contribution, deserve further study.

BOOKS

Henry-Russell Hitchcock, *Architecture: Nineteenth and Twentieth Centuries* (Baltimore: Penguin Books, 1958), xxix+498 pp., 192 pls., 57 figs. $12.50. Pelican History of Art.

Almost all cities and towns we live in have assumed their familiar shape during the period under review in the present volume. This is as true of Europe as it is of America in spite of the patent differences in detail. The buildings discussed predominate in our environment. They are the immediate ancestry of our own architecture, and the forces that went to shape them in many cases still are at work today. This gives its particular poignancy to whatever message we find emerging from the pages; here truly *nostra res agitur* and consequently the problems raised are of unusual magnitude and complexity.

No author better qualified to cope with them could have been found than Professor Hitchcock, who through this work, together with his previous publications on the subject, is responsible for not only opening up entire new stretches of territory but even for mapping them out with accuracy. For years to come his will be a handbook in the true sense of the term, indicating our state of knowledge in the field at mid-century and showing possible directions for future research. An appreciation of this achievement was expressed when recently the College Art Association book award for 1959 went to our author.

It is not easy to describe briefly how Professor Hitchcock has gone about his formidable task, and the reason for this difficulty resides in the nature as well as in the amount of material to be covered. Before we can discuss this problem, however, an attempt at least must be made to record the most relevant facts about the book.

The material is presented in three parts which roughly correspond to the three half-centuries between 1800 and 1950, with a little less space allocated to Part I. A brief introduction refers to the eighteenth-century roots of much that happened subsequently and traces links between the beginning and the end of the period under review—'From Ledoux to Le Corbusier' as Kaufmann put it. Following this, Part I begins with a treatment of 'Romantic Classicism' that shows its rise in England, its spread to the Continent and the New World, and its modification and codification in the hands of J. N. L. Durand. The doctrine and considerable influence throughout Europe of this remarkable professor of the École Polytechnique are discussed in a special chapter that precedes three others which under geographical headings still deal with versions of Romantic Classicism and Durandesque architecture including what is termed *Rundbogenstil* in an expression borrowed from the German. Part I concludes with a discussion of the Picturesque and Gothic revival in its first phase, and a chapter devoted to the technological advances in using iron and glass.

Part II contains, I think, the greatest contributions of the author and is unparalleled in its wealth of new material, interpretation, and assessment. Again some chapters are arranged stylistically and geographically, dealing with 'Second Empire and Cognate Modes', High Victorian Gothic in England, and later neo-Gothic outside England, while others are organized around the work and influence of individual architects such as Shaw, Richardson, and McKim, Mead & White. Finally, he treats the rise of commercial architecture and the development of the detached house in England and America up to 1900. The great importance for the total picture of developments in the English-speaking world comes out in Part II as clearly as in Part I, and here an historical balance is established that has long been needed.

Professor Hitchcock has performed a truly Herculean labor with all this which in more than one way invites comparison to the clearing out of Augeas' stables—not only because of the scholarly neglect of the material before the author went to work on it, but also with regard to its singular unattractiveness, on the surface at least, for our eyes. It has been pointed out on more than one occasion that never in architectural history does there seem to have been such consistent production of ugliness as in the later nineteenth century. In spite of his refreshing and contagious enthusiasm for the period the author as a sensitive critic is not unaware of this, at least when he speaks about the Second Empire and cognate modes in the outlying areas of the western world and states at the end of Chapter 9: 'In an attempt to give an over-all picture too many buildings of low intrinsic quality and little present-day interest have already been cited.' On the other hand, in discussing the Langham Hotel in London he feels: 'That this . . . should within a decade or two have come to seem tasteless and actually ugly—as, indeed, it has seemed to many ever since—is not of major historical consequence. . . . What *is* of consequence is that such High Victorian buildings . . . possessed a vitality and a contemporaneity within their period. . . .' In speaking of vitality Professor Hitchcock touches on a phenomenon that is of particular relevance to architects in our own day; it would have been interesting in this connection to hear in more detail his reactions to Sir John Summerson's pertinent remarks in *Heavenly Mansions* on 'The Glory of Ugliness' in an age about which Alf Bøe was able to write with justification, 'It is a singular fact concerning the design typical of the period that it was disliked not only by the generations following immediately after, but by a great many among the Victorians themselves.'

The last chapter of Part II and the first one of Part III very properly overlap in time for a decade. From the early houses of Frank Lloyd Wright, Voysey, Baillie Scott, and some others, we are taken to the beginnings of Art Nouveau under Victor Horta and to its spread and culmination in the work of Mackintosh and Gaudí. Four chapters follow on 'the first generation of modern architects': Perret, Garnier, Behrens, and other German architects appear together with their contemporaries from Austria, Holland, and Scandinavia; and naturally Frank Lloyd Wright is in the prominent position which he deserves. The 'second generation' is represented primarily by Gropius, Corbusier, Mies van der Rohe, and J. J. P. Oud in two chapters, while in conclusion there is a discussion of 'architecture called traditional in the 20th Century' and of architecture in the 1950s. The last two chapters and that immediately preceding them which begins with the early 30s are prefaced by a short announcement concerning a change in the author's attitude to his material: 'From this point on the ideal objectivity of the historian, attempting disinterestedly to piece the past together . . . is inevitably colored, if not cancelled out, by the subjectivity of the critic. . . .'

The text is supplemented by notes which are mercifully kept to a manageable size, and by a full bibliography. The photographic plates with few exceptions are very well selected and reproduced, but the arrangement sometimes is bewildering. Probably owing to dictates of layout the sequence of plates does not completely concur with that of the text, which means that the visual sequence is not always telling in terms of historical context. This is not without importance in a book destined in part for architects who usually respond more readily to visual messages than to words.

The little summary just given obviously cannot do justice to Professor Hitchcock's panoramic work, nor can a few quotations convey the quality of his prose which at its best is capable of describing such extremely complex phenomena as the personality of an architect, or his work, in a few incisive statements.

Among the many problems which a book of this scope and importance poses to author and reviewer alike is the question of inclusion and omission, and of the placing of accents. The author's decision not to give a 'history of architectural thought rather than of architecture—that is what was actually *built*', and his probable desire to eliminate town planning as far as possible, account for the absence of some things which normally would be considered relevant. Neither J. S. Buckingham's scheme for an ideal city in cast iron with its interesting sociological and technical implications, nor Camillo Sitte's momentous treatise is mentioned. Semper's great theoretical work appears in the bibliography at least, but is not discussed in the text. In fact, Semper is not quite given his due in this reviewer's opinion. The author seems to have felt it, for he added a summarizing footnote (p. 165) on Semper.

As far as later architects are concerned it would be pedantic to insist too much on omissions that are noticed by the specialist in one certain area while they do not seriously interfere with the correctness of the total picture. For the sake of completeness only, it might be worth mentioning that your reviewer from his familiarity with architecture in Central Europe expected to find a number of architects included that are actually missing. Among them is the Dutchman Robert van't Hoff with his remarkable Huis ter Heide; Salvisberg, whose Bleicherhof and industrial work were exemplary in Switzerland for many years; Holzmeister, with his numerous churches, and Strnad, both of whom were influential beyond the borders of Austria, as was R. M. Schindler, whose most outstanding buildings are in California; Hugo Häring, who in some designs anticipated Aalto by a generation and was one of the signers of the declaration of La Sarraz; Max and Bruno Taut, who were among the most colorful architects in Germany between the wars; and Scharoun, who probably made a more important contribution to twentieth-century architecture than most of the people mentioned in Chapter 24. Finally, Aalto would seem to deserve more than the brief paragraph accorded to him.

Professor Hitchcock explains his process of selection at the end of Chapter 11 in the following terms: 'Qualitative considerations have led to a drastic selectivity, emphasizing relatively limited but vital aspects of architectural production at the expense of others that were far more ubiquitous but generally very dull. With different criteria of selection, using different standards of architectural quality—attainment of archaeological plausibility, say; or success or failure in the incorporation of new technical developments; or realization of programmatic aims—several very different pictures could be, and indeed frequently have been, given. . . .'

It would have been interesting to find a more detailed discussion of what actually are the limited but vital aspects that were emphasized. From the author's selection it would seem that one of them must have been unequivocality of visual formulation, regardless of whether it was the outcome of a talent that was essentially 'directional' (setting a direction for future developments) or 'centered' (statical, self-centered) as Norman Shaw, about whom the author rightly says: 'The later history of European architecture would have been much the same . . . had Shaw never existed.'

In the case of Shaw the artistic personality and its formal expression are used to order historical raw material. But a sum of artists' personal styles does not necessarily add up to a coherent whole, to a style in the broader sense of the term. When in retrospect a general style can be recognized it reveals itself as the formal result of those patterning forces in cultural behavior which tend toward 'inhibition of the randomness of instinctive behaviour' (Sapir); it mirrors an underlying common structure, a synthesis of common attitudes and assumptions exactly of the kind that no longer existed in most of the nineteenth century, as Professor Hitchcock has pointed out. He preferred, however, on the whole, to concentrate on architecture rather than on its background, sharing with many architectural historians a legitimate and salutary abhorrence for those generalities that made past builders of great historical systems suspect. Yet, being the genuine historian and critic which he is, he naturally could not fail to note the danger that he might have to pay for his gains in positive fact by a loss in conceptual clarity of presentation. So he

scrutinized his period for inherent categories of conceptual order, and his results deserve our careful attention.

Having wisely refused to accept the superficial classification in so many revivals, he introduces as his *leitmotif* a juxtaposition of Romantic Classicism and the Picturesque with *Rundbogenstil* as a special version growing out of Romantic Classicism. Subsequently (p. 132) he confronts High Victorian Gothic and the Second Empire in a comparable fashion, linking them with their predecessors: 'The one had its roots in the Picturesque, but differed from earlier Picturesque manifestations in being a "style"—or very nearly such—not merely the reflection of a point of view. The other had roots not only in Romantic Classicism but also further back. . . .'

We are presented with a view here that sees two great antithetical categories in nineteenth-century architecture, but to this reviewer it is not quite clear on which conceptual and terminological level they are truly commensurable. The author himself points out that the term Romantic Classicism is a 'twentieth-century historian's invention', and he describes it as 'the nearly universal style with which nineteenth-century architecture began' (p. xxvii). But Professor Giedion, who introduced the term Romantic Classicism in 1922, held that 'Classicism is not a style. Classicism is a hue.' (Klassizismus ist kein Stil. Klassizismus ist eine Färbung.) Later both the Victorian Gothic and the Second Empire are referred to as 'high phases of style', but on the whole the author seems to prefer the term 'mode' in connection with Second Empire rather than the term 'style' and he obviously felt that in some cases the term 'style' was more applicable than in others. 'Mode' seems admirably suited for dealing with many phenomena in nineteenth-century architecture, since it is a term that indicates rather a fashion and a mood in which things are done than a consistent system of forms. This fact is clearly indicated by the French and German derivations from the original Latin *modus*: *la mode* and *die Mode* (literally translated as fashion).

As far as the *Rundbogenstil* is concerned it may be less fortunate as an attempted terminological revival than is generally realized by most English-speaking scholars because in German the term already carries a well-established meaning that is given in *Wasmuth's Lexikon der Baukunst* as 'ältere Bezeichnung für den romanischen Stil' (older term for the Romanesque style). With such an original meaning it is hard to reconcile a statement such as 'Hübsch's churches are . . . more Romanesquoid than *Rundbogenstil*.' Karl Möllinger, whose *Elemente des Rundbogenstils* is quoted by the author, used the term in contradistinction to *Spitzbogenstil* (pointed-arch style), and in his later book *Die deutsch-romanische Architektur* of 1891 he inserted the interesting remark '. . . bietet die Bezeichnung der Zeit, der ein Kunstwerk angehört, sicherere Anhaltspunkte für dessen Beurteilung, als ein bloss willkürlich gewähltes Stichwort.' (. . . the term applied to the time from which a work of art originated provides safer clues for its judgment than a catch-word that has merely been selected arbitrarily.) Here an opinion is voiced which favors historically descriptive over stylistically descriptive terms, and as far as parts of the nineteenth century are concerned there may be something to this. How otherwise could we cover divergent phenomena of the kind Professor Hitchcock has in mind when he writes: '. . . the greatest masters of Romantic Classicism were often those who were most ready to explore the alternative possibilities of the Picturesque. . . . Parallel architectural events, even strictly contemporary works by the same architect, must be set in their proper places in at least two different sequences of development' (p. xxviii). The question here is how far do these two sequences of development into which works by the same architect are placed today correspond to the actual situation at the time when these works were created. Might it be possible to find a different framework of historical reference into which they would fit with less effort? Such a question is rather unfair for the author and it is only posed here in order to stress the very unique nature of the period under discussion as compared to earlier ones.

It was a period which saw an eclecticism of form that is unparalleled in earlier architectural history and indicative of a profound change in attitude towards both form and history. This striking phenomenon is so well known that further discussion is as little needed here as it was in the book under review. It is only mentioned because of its methodological implications; obviously stylistic analysis of the kind that proved its usefulness for earlier periods cannot be assumed necessarily to possess equal validity for nineteenth- and twentieth-century architecture since it has to deal with phenomena of a different kind.

For this reason it is gratifying to find that Professor Hitchcock does vary his method of approach subtly as the case demands. He is most successful, in your reviewer's opinion, in those chapters which are organized around artistic personalities or on a technological and typological basis. Observations about the emergence and perfection of new building types such as museums, railway stations, hotels, clubhouses, commercial buildings, etc., are among the most enlightening passages of the book. Here we find a treatment of artistic form 'in the direction of the essential, of the functional as opposed to the impressive' ('in der Richtung zum Wesentlichen, zum Funktionellen gegenueber dem Impressiven') (Klee), that is fruitful indeed.

It is the kind of treatment that is most compatible with the morphological approach shared by such pioneers as Klee and Kandinsky who always were concerned with form but rarely discussed style. It is an approach that seems more relevant than ever when we consider the historic situation of architecture today as recounted in the last chapter of our volume, and as we confront some of the recent attempts to define it stylistically. No unity of architectural formulation can be detected as long as it is expected to result from an application of the concept of a general style evolved for earlier periods. Consequently, personal arbitrariness is made to appear as the only guiding factor, and a spurious theoretical underpinning is given to every kind of formalistic license, which in turn leads to more architectural examples of apparent disparity forming a truly vicious circle. But an underlying order becomes apparent as soon as forms are questioned for their authenticity in terms of their full context, from a grasp of all their conditions through a genuinely morphological approach.

There are many things to be grateful for in Henry Russell Hitchcock's book. But not the least of them is the fact that beyond its excellence which I hope has been made clear in this review, it raises problems which touch the very core of architectural life. It forces us to reconsider the state of method in architectural history and criticism for the nineteenth and twentieth centuries, and the state of architecture around us, before we can go on from where the author has taken us—from the high point which we might not have reached for a long time had it not been for his outstanding achievement.

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Gilbert Herbert, *The Synthetic Vision of Walter Gropius* (Johannesburg: Witwatersrand University Press, 1959), viii+48 pp., 22 figs. 19s.6d.

In a *libellus* of something under fifty pages, Gilbert Herbert presents an essay, *The Synthetic Vision of Walter Gropius*, originally prepared in the form of lectures and later given periodical form in the *South African Architectural Record*. Walter Gropius provides a foreword of approval to a convenient and intelligent summary of his theory and practice. In three chapters his career as writer, creative architect, and educator are commented upon and each chapter is followed by several pages of informing illustrations selected from the Bauhaus, Harvard, and Architects' Collaborative phases of his activities. Philosophically, Gropius' position is shown to have an Hegelian base and it is related to Whitehead's Organism and J. C. Smuts' Holism, but distinguished from Wright's romantically-tinged Organism. Integration of the biological, psychological, social, economic, and intellectual human forces in the creation of forms is stressed, and both the mental and intuitive aspects of artistic creativity are related to each other. The use of prefabrication and standardized parts and the two-way tensions between part and whole leading to a synthetic type of visual communication are discussed as basic in Gropius' thinking whether the object is a chair or a regional plan. The impersonal emphasis, so often cited in criticism of the International Style, is here shorn of its force by Herbert by relating impersonality to universality in contrast to materiality. The absorption of individuality in team co-ordination, the desirability of a close relationship between theory and practice, and the 'dynamic imagery' of the new visual language are further ways of giving three dimensions to the synthetic vision here being considered. Whitehead is quoted as saying, 'there is only one subject-matter for education and that is Life in all its manifestations . . . a single unity', and Gropius is quoted from his *Scope of Total Architecture* as pointing out that architecture involves 'land, nature, man and his art as one great entity'.

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Christopher Hussey, *English Country Houses: Late Georgian, 1800–1840* (Fairlawn, N. J.: Essential Books, for Country Life, London, 1958). $20.50.

This, as most *Journal* readers will know already (it was published in October 1958), is the third in Christopher Hussey's series on English Country Houses. What has been said of the earlier two volumes (*Early Georgian: 1715–60*; *Mid-Georgian: 1760–1800*) applies equally well to it. It is in its way and of its kind a classic—indispensable to anyone seriously or even incidentally concerned with the periods in question, and of particular interest to students of American architecture for the many parallels to, and possible sources of, Federal building styles it presents.

Like its predecessors, this book consists in the main of a series of extensive studies of country houses—twenty-two in all, some of them only scantily or never published before—wholly or mostly built within a given period (in this case, 1800–1840), plus an introduction which purports to set them within a cultural pattern and includes references to another thirty or more examples. With the main studies little fault could be found. Fine and profuse photographs cover every aspect of exterior and interior detail, furniture, and decorative arts, while the text, besides providing a wealth of material on major and minor builders, designers, landscape architects, and cabinetmakers of the time, also deals with family history geography, gardens, and incidental matters of all sorts. The result is a guided tour of the age, if you like, given by a master at the art. The introduction, however, is far from as satisfying.

More obviously than most, the period from 1800 to 1840 was an age of transition. In the eighteenth century you have taste and form determined by one fairly consistent set of principles—precision, balance, self-containment, the proportional system of classical humanism; while in the Victorian period symbolism and picturesqueness are the determinants. Between them is the age covered in this book. In it, a generally accepted uniformity of style suddenly breaks up into a confusion of competing modes or manners—Tudor, Palladian, Gothic, Renaissance, Greek, all jostling for precedence. These are no longer styles in the old sense, however; they are self-conscious revivals undertaken for reasons extrinsic to architecture, on literary, patriotic, or sentimental grounds.

All of which Hussey, as a great authority in his field, knows perfectly well, of course. Indeed, in his introduction he not only recognizes that the art of architecture is somehow changing in this period—becoming more a matter of symbolism and associative values than of formal aesthetic values—but he adds significantly to our understanding of what is going on. Under the heading Romance and Reform he writes, for example (p. 22):

> The most influential train of thought with landowners during these decades was set up by the growing power and wealth of the urban middle class, and fear of what 'democracy' portended . . . that their independence would be crushed between egalitarian and material forces: to which they reacted, it would seem, by emphasizing in the architecture of their houses, the 'romance' of ancient aristocracy. . . . In architecture the aspirations of the commercial and professional middle class became identified with the 'pretentious monotony' of classical stucco spreading around the 'Great Wen' and the expanding cities, whilst territorial claims, genuine as they might be, attached exaggerated significance to sham towers and battlements. Thus the Regency's sentimental vogue for old-fashioned styles of building acquired the importance of a manifesto for the preservation of 'Merrie England'. A country mansion must now above all be distinct from urban associations, declare itself the residence of a nobleman, part of the land's historic scenery.

Unfortunately, however, the author did not choose to organize his material in terms of a transition, with progressive (i.e., Early Victorian) and conservative (i.e., survivals of the eighteenth-century aesthetic) trends. Instead, he chose to consider it (influenced perhaps by the three-volume format) as essentially a continuation of the Georgian age, and its proliferating manners as simply further developments out of mid-Georgian Gothick, and *Chinoiserie*. The result is an emphasis on differentiation among the various styles, instead of the new approach to architecture they all manifest in common. His appendix of Principal Architects and Country Houses (a most useful feature, needless to say) thus has a stylistic indication for each building, as C=classical, It=Italianate, Cast=Castellated, etc. Such a categorization can barely be brought off in this period (there is one catchall already—Pic=Picturesque) and would assuredly leave him floundering were it carried many years further. Already, indeed, it brings him to the point of maintaining that under William IV there was a 'reformed romantic' synthesis, whereby the 'truths of historic styles and current science' (or alternatively, romantic visual qualities and classical order) were united—a conception which, as explained here, smacks not a little of late mediaeval scholasticism.

Nor did the author attempt to resolve any of the confusion that is apparent in this period (not uniquely, of course, but more conspicuously than in others) between chronological and descriptive usage of terms. Thus, while he uses Late Georgian as a chronological term, so that the New Palace of Westminster 'can be recognized as the representative masterpiece of the Late Georgian period', Regency is used to indicate a kind of style, or more exactly 'a characteristic flavor

given to a variety of styles'. Neo-classical, too, is a term used with extraordinary agility to mean alternately and at once the kind of close dependence on archaeological prototypes exemplified in the Pantheon added to Ince Blundell Hall in 1802–1810, simplified and generalized classical inspiration like that evidenced in Rudding Park, Yorkshire, 1807–1825 (so similar in feeling to New England examples like Gore Place, Waltham), and individualistic treatments like the library at Grimston Park, Yorkshire, *c.* 1840–1850, 'one of the last in the Neo-classical sequence from Soane'.

The result, generally speaking, is that the descriptive chapters hang together li .e beads on a string—each a pearl in itself, but with only a tenuous relationship to the others. The suggestion that Pugin's Scarisbrick entrance and hall somehow put an end to discontinuity by 'heralding a new age in architecture' and expressing 'the fundamental change taking place in the ethics of architecture' is singularly unconvincing because, of course, Pugin was only practicing that sure formula for success, repeating in a louder voice what everybody accepted already; as Hussey himself has pointed out, the style of these country houses was being determined by associative and symbolic values long before Pugin was ever heard of. If Pugin is to be brought into this period at all, surely it is not as the harbinger of a new era, but as the consummation and formulation of a changed attitude that had set in thirty years before—what Professors Meeks, Hitchcock, and others call the Early Victorian phase of nineteenth-century architecture. Using their system of organization—Early, High, and Late Victorian—it would have been easy to treat the buildings here, not as a welter of conflicting idioms, but as exemplifying a consistent progression from the eighteenth century towards Victorian aesthetics. To regret that Hussey did not choose this organization, but stuck instead to the older concept of a 'battle of the styles', is not to criticize the book, only to express disappointment that he missed an opportunity of setting the material of which he has so unrivalled a command into a pattern more meaningful for the cultural history of the nineteenth century.

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Frank Lloyd Wright, Drawings for a Living Architecture, with essays by Giuseppe Samonà and A. Hyatt Mayor (New York: Horizon Press, 1959), 248 pp., illus. $35.00.

Not since the Wasmuth portfolios of 1910, of which few copies are available in America, has such a sumptuous collection of Wright material been published. Considering that the earlier publication, covering only the first score of years of Wright's productive career of three-quarters of a century, has been offered this winter at $125.00, the $35.00 price of this handsome volume, which includes drawings made over the years from the mid-1880s to the late 1950s, can hardly be considered excessive. The luxury of the book is not laid on. Its very large size, only a little smaller than the dimensions of the Wasmuth portfolios, permits the reproduction of many of the drawings at or near the original size—information that might well have been given in the legends. Some of the sketches, indeed, appear to have been enlarged in the reproductions, not always with a happy result. The use of color for so many of the plates produces near-facsimiles; and, where the original crayon renderings were on opaque paper, the results are extremely attractive and altogether plausible. Naturally those originally drawn on tracing paper do not fare so well.

The introductory texts are brief and not especially interesting—two tributes by Professor Samonà of the University of Venice and by Hyatt Mayor of the Metropolitan Museum. But the plates, of which there are some 200, many of them double, offer such a wealth of material, including many quite unknown projects, that it is hard to know how to go about suggesting their value. That value is both intrinsic to the drawings themselves and also correlative to existing studies of Wright's *oeuvre* such as my own *In the Nature of Materials* which, because it came out in 1942, necessarily fails to cover eighteen years of Wright's production, and Grant Manson's volumes, of which only the first, carrying the story to 1910, has so far appeared.

The organization of the plates is—rather loosely—topical, not chronological. Thus, unless one knows precisely what one is looking for and can use the index, it is necessary to go through the whole of the book to find particular drawings. The drawings, moreover, are very varied in character, many of them 'presentation' perspectives, such as have often appeared in the magazines in the last twenty-five years but including quite a few that have never been thus published, and—much more precious to the student—sketch-plans and perspectives both of famous executed works such as the Unity Church or the Imperial Hotel and of quite unknown projects. It may be interesting and helpful, therefore, to comment here in chronological sequence on certain of the items that have special interest, giving in each case the page references. This will indicate, at least, the extensive range of the material that is here made available from all the successive periods of Wright's work from the '80s to his death.

The earliest drawing, presumably of 1885 or 1886, on p. [6]—the reverse of the title page—is a curiosity only. It reveals, however, that if Wright received no specifically architectural instruction during his brief stay at the University of Wisconsin, he was well-trained in mechanical drawing, in solid geometry, and even in sciography. The next earliest drawing (p. 154), a mere fragment dating presumably from about 1888, indicates how skillful Wright became in the Adler & Sullivan office in working out large-scale drawings of Sullivan's ornament—which was, of course, coming to mature crystallization at just that point.

What I believe to be the next drawing is rather more interesting, but its date is controversial. The elevation (p. 20) of a house of very distinctly Wrightian quality is here identified as a 'Presentation drawing shown to Louis Sullivan, 1888, when Wright applied for work. This also was used for a house project for Henry N. Cooper of La Grange, Illinois, in 1890.' The former statement expresses Wright's own belief as to this house-project, of which a plan also exists at Taliesin. Comparison with the drawings done—and signed—by Wright in 1887 for J. L. Silsbee and in 1888 for Adler & Sullivan (published most lately by Manson in *Frank Lloyd Wright to 1910*, figs. 5, 7, 8, 9, and 11) indicates that the reproduced drawing must be later, although it is possible that it was—as I said in *In the Nature of Materials* (p. 107)—'based . . . on a design prepared previous to joining Sullivan.' Manson in *Frank Lloyd Wright to 1910* (p. 73) mentions Henry Cooper as a client who approached Wright only after he began independent practice in 1893. My present belief is that the reproduced drawing is of the early '90s, not more than a year before 1890, certainly, and even more certainly not later than 1893.

Were this not a fascinatingly premonitory design for a relatively large suburban house, quite out of a class with most of the 'bootleg' houses executed by Wright in those years, the critical and historical point would be inconsequential. But the ingenious semioctagonal organization of the plan with development along diagonals, owing presumably a good deal to various McKim, Mead & White house-plans of the mid- and late '80s, the very strong horizontal emphasis, and the towerlike semicylindrical bay-window projection, recalling both the dining room bay of the Blossom House of 1892 and the dominant motif of the Walter Gale House completed the next year, here combine in what is certainly the most genial of Wright's very

early domestic designs. It is unfortunate that Manson does not discuss this problem. However, he may never have seen this elevation, now published for the first time, or the unpublished plan extant at Taliesin that goes with it.

There are several drawings of 1895, the most interesting a very freehand bird's-eye-view sketch (p. 155) for the vast project of that year for the Wolf Lake Amusement Park. This illustrates a surprising command of academic organization somewhat in the tradition of the World's Fair of 1893. For 1897 there is an early elevation of the Heller House (p. 246)—which is here wrongly identified as the Husser House of 1899—together with a sketch for its Sullivanian terra cotta frieze. A detail of an almost equally Sullivanian terra cotta capital on the latter house is given on p. 166.

For study of Wright as an urbanist—or an anti-urbanist!—both the very early Wolf Lake drawing and the sketch (pp. 196–197) for the Quadrangle Block Plan for Residential Subdivision of 1900 are important. For its influence on the later 'international' architecture of the 1920s the Yahara Boat Club project of 1902 with its slab roof, which was published in the Wasmuth portfolio in 1910, is very important also. It is good to have here a perspective from one end (p. 70) that clearly emphasizes its proto-Neoplasticist character.

The sumptuous Dana House in Springfield, Illinois, was always dearer to Wright himself than to most of his admirers. The perspectives (pp. 206–207) and the ornamental details (pp. 210, 211, 244) help to explain its really great interest, above all that of the interiors where the spatial development is especially complex in its articulation. The date given—'1902–04'—is probably more accurate than '1903' as I gave it in *In the Nature of Materials*, for Manson states in *Frank Lloyd Wright to 1910* (p. 120): 'It was completed in July, 1904, after a two-year building campaign.'

The sketch perspective of the small and rather exceptional Lamp House of 1904 (p. 110) brings us close to the mystery of Wright's process of creation, as does the other drawing of this year for the unexecuted Hultman House (p. 222). What illustrates an even earlier stage in the creative process is seen in the very rudimentary sketch-plan of 1907 for the Coonley House (p. 66) and that of 1911 for the Booth House (p. 67). On the other hand the quite unknown project for a dress shop (pp. 230–231), 'around 1912', is rather completely worked out for all its sketchiness.

For Wright's years in Japan the most interesting drawings are a section (pp. 50–51), presumably of 1916 or 1917, of the Imperial Hotel and a perspective of the Odowara Hotel project (pp. 52–53) of 1917. The latter double-plate is overenlarged, which doubtless makes it more impressive; but actually the small halftone of it provided in *In the Nature of Materials* is clearer.

The drawings of the vast Doheny Ranch project (pp. 106, 118, 120, and 122) round out our picture of this complex scheme which is of great urbanistic as well as architectural significance. The visible date on one of the drawings—'March 20, 1923' in Wright's handwriting—indicates that work on this project, initiated in 1921, extended over several years. It seems possible, however, that the date '1921', although possibly added later by Wright, on a study for a concrete 'Block house' (p. 186) may be correct. Although this is two years before the building of the first such house, La Miniatura in Pasadena (p. 105), the use of concrete block seems to have been considered from the first for the Doheny project. The Barnsdall Kindergarten project of 1923, here shown in a somewhat rubbed colored crayon perspective (p. 109), is also a splendid example of this brief Los Angeles phase of Wright's career.

The projects of 1926, similarly presented, for childrens' playhouses in the parks of Oak Park (pp. 72, 80–81) add material of real interest in what were the thinnest years of Wright's career. On the other hand the magnificent double-plate, also in color, of the San Marcos project of 1927 (pp. 128–129) gives body to a design known hitherto from line drawings usually reproduced at very small scale. The background here of the desert and the mountains is a landscape picture magnificent in its own right, for it is much less schematic than the settings included in most of Wright's perspectives.

In spite of his disgust with large cities, Wright occasionally faced their architectural problems. The Skyscraper Regulation Scheme of 1931 (pp. 174–175) for Chicago is a fascinating case in point. It relates, loosely at least, to the National Life Insurance skyscraper project of 1924 (p. 187), and still more directly to Wright's aspirations for the 1933 Chicago Exposition. Quite different is a drawing of ornamental detail of 1932 (p. 247). This is an almost Butterfieldian patterned wall in three colors of brick, proposed for the Willey House as first designed in that year, but not used on the executed house of two years later.

Especially interesting are the sketches of 1936 for one of his great masterpieces, Falling Water (pp. 89, 90, 93). The preliminary sketch (pp. 98–99) for the Marcus House of the previous year, a project published in January 1938 in the *Architectural Forum*, is also of value as illustrating his method of design in these crucial years when he was swinging into his great late revival of creative and productive activity. Of a quite different order from these millionaires' mansions are the All-Steel House projects for prefabrication (pp. 190, 192, 194) of 1937—never published hitherto, I believe, but known to me through a drawing that Wright gave me.

The Burlingham House project (pp. 136–137) is here dated 1941 although it is not among the supplementary list of ten commissions that Wright supplied to me in October of that year as then being 'designed or . . . already in construction'. However that may be, this house with its fascinating plan of segmental curves and its walls of curved section, intended to be carried out in adobe, seems to belong with the postwar work, which has more usually been thought to begin with the first Guggenheim Museum project—that was, of course, actually designed over the years 1943–1946.

It is impossible even to summarize the material here provided for the very productive years of 1945–1958. Although by that time the magazines were ready enough to publish Wright's projects, even wholly speculative schemes such as the Mile High Skyscraper (of which very early plan-sketches of 1956 are here shown at unintelligibly small scale on p. 168) or the Arizona Capitol (pp. 25, 26) of 1957, so much material on the work and projects of that amazingly prolific terminal period has never before been assembled. One can only pick out a few items for specific mention here, mostly drawings of unexecuted projects: the remarkable Adelman Laundry project of 1945 (pp. 188–189) with its balloon-type roof above an out-slanting cylinder of concrete (pre-stressed?) that in some respects rivals the contemporary Guggenheim Museum project; the extensive range of drawings (pp. 58–65, 68–69) illustrating many aspects of the Huntington Hartford Country Club project of 1947, including the Ledoux-like spherical house for the owner; and the related project of that same year, with its clustered clam-shell roofs for the Daphne Funeral Chapels (pp. 232–234). Of quite another order—practically pure engineering—is the San Francisco Bay Bridge project of 1949 (pp. 30–31).

If, on the whole, exploitation of curved forms most characterizes these years, there were plenty of straightforwardly rectangular designs as well. The Racine YWCA project of 1949 (pp. 36–37) contrasts thus with the contemporary Johnson Wax tower, rising nearby at that same time, as does the Bloomfield House project of that year (pp. 138–139), a belated Usonian example recalling the houses of the mid- and late '30s. Angled plans, based on triangular modules, however, were never more 'reflex'—to use a favorite word of Wright's—than in these years: the Chahroudi House project of 1950 (pp. 146–147), for example, and the executed Berger House of 1951 (pp. 218–219).

Utilizing angles as well as curves in the planning, the Bailleres House project of 1952 (pp. 43, 44–45), with its multitude of clam-shell roofs, is a superb semitropical invention. What a pity this one work of Wright's designed for Mexico was never executed! Happily

the wholly rectangular Oboler House of 1954 (p. 115), if less dramatic than the earlier project of 1941 for this client (pp. 148–149), has presumably been completed by now. The execution of the Monona Terrace project of 1955 (pp. 32–33) for Madison, Wisconsin, was defeated by political jugglery. But the even grander scheme for the Marin County Buildings in California, designed in 1958 (pp. 34–35), with its aqueduct-like ranges of segmental arches, is under way—Wright's only buildings commissioned by a public agency.

Thus one might go on and on, calling to attention notable individual works as seen in the profusion of drawings reproduced in this volume. But, while enjoying the graphic feast that the book so superbly offers, it is well to remember that these are but portents and shadows of great executed buildings. Happily, as the Guggenheim Museum and the newly opened Dallas Theater testify, even Wright's death has not yet deprived us of new monuments that are the distinguished product of his creative brain. Some—perhaps many—others that were initiated before his death, or for which he left complete drawings, should still come to realization in the next few years.

A final word: it is a pity this splendid compilation has no author, for this is one of the most notable contributions to the architectural history of the last seventy-five years, and more than worthy of an award from our Society.

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S. G. Gillam, *The Building Accounts of the Radcliffe Camera* (Oxford: The Clarendon Press for the Oxford Historical Society, 1958), 189 pp., 62 pls. £2/2.

In appraising a building we are no longer satisfied, as our fathers were, when we have established the name of the architect, analyzed the various features of the design, and assigned it to its architectural period. We are conscious of it as a composite production; it interests us not only as an aesthetic experience but also as a technical achievement; we see in it the fruit of many men's thoughts and many men's hands. Is this the architect's design as he originally conceived it or has it been modified to meet the criticisms of a knowledgeable patron or the conservative views of some board or committee? Who were the craftsmen responsible for interpreting his drawings, contributing to the various parts their individual expert skills? How was the labor force organized? Did a particular effect depend on the precise nature of the material used, and what exactly was the material? What was the original scheme of decoration before later fashions were superimposed? How far, indeed, does the building we see at all resemble the original structure? In the hope of finding answers to these and similar questions, likely storage places are being searched for such records as old account books, business letters, bundles of workmen's bills, rolls of discarded drawings, the minute books of committee meetings, material long believed to be of small interest but now eagerly seized upon, edited, and published. These researches have, on occasion, had gratifying practical results in the recovery of lost masterpieces of architectural art. Notable instances are the Queen's House at Greenwich, designed by Inigo Jones and once known as the House of Delight; Lord Burlington's elegant Chiswick villa; and Nash's Aladdinlike Royal Pavilion at Brighton, all of which had become so degraded by later additions, tactless repairs, and years of neglect as to have been rendered virtually invisible but, carefully restored to their original condition, are now again part of the national treasure. At Oxford, too, the recently instituted Repair Fund has encouraged University and College authorities to hunt in their archives for evidence of the original appearance of some of their ancient buildings. As a result Wren's Sheldonian Theatre is on the way to regaining its youthful gaiety, Hawksmoor's Clarendon Building nearby has now resumed its noble Roman dignity, and Christ Church Library its Baroque grandeur; for here it is the buildings of the classic period, erected in the late seventeenth and eighteenth centuries, often of too-soft Headington stone, which have suffered most from the ravages of weather and fashion.

The present volume in the Oxford Historical Society Series deals with the erection of another famous Oxford building of that period, but one to which time on the whole has been kind, the Radcliffe Camera, or Radcliffe Library as it was formerly called. Admired by contemporaries as 'the most magnificent structure in Oxford', we can still hardly fail to recognize it as an outstanding piece of architecture, remote though it is from modern ideas of a good design in that, as originally conceived, a less functional building would be difficult to imagine. Although intended under Dr. Radcliffe's will for a library, no provision at all was made in the plans for illuminating or warming its single, huge, circular, domed chamber (the ground floor was at first, and for many years, an open undercroft, for use as a vestibule or promenade). One eighteenth-century critic dubbed it a mausoleum and another predicted, ''twould be a decoration if not of much use to the University', a verdict certainly borne out during the first hundred years or so of its history when it languished neglected and nearly empty. A series of gradual changes, however, in status, structure, and fittings have by now transformed the interior into splendidly commodious reading rooms for the Bodleian.

In an exhibition held in April 1949 to mark the bicentenary of the opening ceremony, items of particular interest, lent by the Trustees, were a folio volume entitled 'Workmen's Contracts and Bills for building the Radcliffe Library' and the Minute Books of the Trustees' meetings; also on view were a large number of designs and drawings relating to the structure before, during, and after erection, collected from various sources. The whole of the folio volume, which contains the complete accounts for the £43,226. 6s. 3d. spent during the building operations, is printed here, together with relevant extracts from the Trustees' Minute Books to 1866 when the Library lost its independent status and became part of the Bodleian. Mr. Gillam has written a helpful introduction giving a short history of the building based on these documents and other contemporary material, and Mr. W. A. Pantin has appended a useful list, as far as possible in chronological order, of such drawings and designs as are known to exist, with photographed reproductions of the more important.

With this material assembled before us, we can watch the early beginnings, the growth, and gradual realization of the whole grandiose project, from Dr. Radcliffe's first tentative proposal to enlarge the Bodleian with an addition to the Selden End. We can trace the complex evolution of the design and are free to speculate about such possible influences as the Roman Pantheon, Palladio's Villa Rotunda, Wren's unexecuted designs for Trinity College Library at Cambridge, and the Windsor mausoleum for Charles I, on how much it owes to Hawksmoor's delight in antiquity, and how much to Gibbs's Mannerist proclivities. The presence in the accounts of such famous names as Townesend of Oxford and Smith of Warwick, the two firms of mason contractors, whose principals were considerable architects in their own right, of Joseph Artari, the Italian 'gentleman plasterer', also employed at Holkham and St. Martin-in-the-Fields, of Robert Bakewell, the celebrated ironsmith of Derby, and Rysbrack, the best-known portrait sculptor of the day, furthers our knowledge of those craftsmen while increasing our appreciative understanding of the building. We learn much about wages, prices, and terms of contract, noting in passing many such varied points of interest as that a journeyman mason in Oxford in 1740 was paid less than his predecessor in London eighty years earlier but a carpenter was paid more, that the Trustees accepted responsibility for the

maintenance of the widow of a workman killed by a falling scaffold, and that what had formerly been called a 'house of office' is now termed a 'boghouse'. We realize how narrowly the Radcliffe Library escaped the shabby fate of most of Townesend's other buildings in Oxford which were faced with cheap Headington freestone instead of, as here, with the more durable, and expensive, Burford stone from the Taynton quarries. But here there was no stint for money. Dr. Radcliffe left ample provision and the Trustees seem generally to have been wise administrators who employed efficient servants. They could afford to accept the highest tender and buy the better quality material; bills were settled promptly. Gibbs himself, as the architect in charge, paid tribute to their 'punctual Payments and great Diligence in seeing every Part put in Execution, with the nicest Oeconomy and Equity'. Whatever its failings as a library, and at first they were many—no policy, few books, and negligent librarians—as a building project it was undoubtedly a success. Oxford would indeed be the poorer without this graceful, round, classico-Italian edifice which is so happily married to its Gothic neighbors in Radcliffe Square. As we walk up Catte Street from the Broad, there slowly move into view first the cube of the Bodleian, then the cylinder of the Radcliffe, and finally the cone of St. Mary's spire—'the greatest architectural sequence in England', declared Thomas Sharp. 'A first class aesthetic experience, to be treated with awe.'

I have only one criticism to make of this carefully edited sourcebook; namely, that a street plan of the area has not been included among the illustrations for the benefit of readers unfamiliar with the layout of Oxford. Gibbs provided such a plan in his *Bibliotheca Radcliffiana* (1747), which might with advantage have been reproduced here.

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Books Received

(Mention of a book here does not preclude its subsequent review)

Françoise Choay, *Le Corbusier* (New York: George Braziller, 1960), 48 pp., 87 illus. $3.95. Masters of World Architecture.

George Collins, *Antonio Gaudí* (New York: George Braziller, 1960), 48 pp., 107 illus. (8 in color) $3.95. Masters of World Architecture.

Ernest Allen Connally, *Printed Books on Architecture, 1485–1805* (Urbana: University of Illinois Library, 1960), 39 pp.

Catalogue of an exhibition of 38 books held during May and June 1960, arranged by Helen Margaret Reynolds, Assistant Architectural Librarian, with a brief historical text and catalog by Professor Connally.

Willard Connely, *Louis Sullivan As He Lived* (New York: Horizon Press, 1960), 322 pp., 44 pls. $6.50.

R. A. Cordingley (ed.), *Normand's Parallel of the Orders of Architecture, Greek, Roman, and Renaissance* (Chicago: Quadrangle Books, 1960), 6th ed., 16 pp., 80 pls., 4 figs. $5.00.

First published in 1819, the present edition contains the 64 plates of the original with additional ones from later editions by J. M. von Mauch, A. C. Pugin, and R. A. Cordingley.

A. Dorgelo, *Modern European Architecture* (Princeton: Elsevier Publishing Co., 1960), 247 pp. illus. $27.50.

Richly illustrated with photographs, plans, and sections, the brief text is primarily concerned with technical data.

Arthur Drexler, *Ludwig Mies van der Rohe* (New York: George Braziller, 1960), 43 pp., 111 illus., 10 figs. $3.95. Masters of World Architecture.

Katherine Fremantle, *The Baroque Town Hall of Amsterdam* (Utrecht: Haentjens, Dekker, and Gumbert, 1959), 216 pp., 205 pls. fl65. Utrechtse Kunsthistoriche Studien IV.

Frederick Gutheim, *Alvar Aalto* (New York: George Braziller, 1960), 45 pp., 122 illus. $3.95. Masters of World Architecture.

Ada Louise Huxtable, *Pier Luigi Nervi* (New York: George Braziller, 1960), 44 pp., 131 illus. $3.95. Masters of World Architecture.

Edgar Kaufmann and Ben Raeburn (eds.), *Frank Lloyd Wright: Writings and Buildings* (New York: Horizon Press, 1960), 346 pp., 150 illus. $3.95. Published as a paper-bound by Meridian Books at $1.95.

Richard Krautheimer, Wolfgang Frankl, and Spencer Corbett, *Corpus Basilicarum Christianarum Romae, The Early Christian Basilicas of Rome (IV–IX Cent.)* Vol. II, no. 1 (Vatican City: Pontificio Istituto di Archeologia Cristiana and Institute of Fine Arts, New York University, 1959), 144 pp., 8 pls., 123 figs. Monumenti di Archeologia Cristiana II, Serie II.

The latest part of this monumental undertaking is devoted to S. Lorenzo Fuori Le Mura.

Clay Lancaster, *Architectural Follies in America* (Rutland: Charles E. Tuttle Co., 1960), 243 pp., 79 illus. (mostly in color) $10.00.

Morris L. Radoff, *The County Courthouses and Records of Maryland, Part One: The Courthouses* (Annapolis: The Hall of Records Commission of the State of Maryland, 1960), 175 pp., illus., $5.00. Publications no. 12.

David Talbot Rice (ed.), *The Great Palace of the Byzantine Emperors* (Chicago: Quadrangle Books, 1958), 203 pp., 50 pls. (4 in color), 45 figs., 6 plans. $25.00. Walker Trust, University of St. Andrews, Second Report.

Vincent Scully, Jr., *Frank Lloyd Wright* (New York: George Braziller, 1960), 44 pp., 127 illus. $3.95. Masters of World Architecture.

Unesco, *The Organization of Museums, Practical Advice* (New York: Columbia University Press, 1960), 181 pp., 77 illus. $6.00. Museums and Monuments IX.

Edward Waugh and Elizabeth Waugh, *The South Builds, New Architecture in the Old South*, preface by Henry Kamphoefner (Chapel Hill: University of North Carolina Press, 1960), 173 pp., illus. $12.50.

A richly illustrated survey with a limited text.

John Marshall Woodbridge and Sally Byrne Woodbridge, *Buildings of the Bay Area, A Guide to the Architecture of the San Francisco Bay Region* (New York: Grove Press, 1960), 157 pp., illus. $1.95.

A handy guide, complete with maps and stamp-sized illustrations, and a brief text including a note on San Francisco Bay Region architecture by William W. Wurster. The book was produced with assistance of a special committee of the Northern California chapter of the American Institute of Architects.

Periodicals Received

The Journal of the British Archaeological Association, London, Third series, Vol. XXII, 1959, 25 s.

Contains 'The Pre-Conquest Basilica at Lydd' by E. Dudley, C. Jackson, and Eric G. M. Fletcher.

Zodiac, Rivista internazionale d'Architettura contemporanea, Milan, No. 3, 1959. American Distributor, George Wittenborn and Co., New York.

Journal of the Royal Society of Arts, London.

No. 5045, Apr. 1960.

No. 5046, May 1960.

No. 5047, June 1960.

Archivo Español de Arte

No. 128, Oct.–Dec. 1959.

Includes the following article: M. A. G. Guinea, 'La iglesia románica de Santa Eufemia de Cozuelos (Palencia)'.

No. 129, Jan.–Mar. 1960.

Includes the following articles: L. T. Balbás, 'Naves cubiertas con armadura de madera sobre arcos perpiaños a partir del siglo XIII', and A. B. Correa, 'Túmulos del Emperador Carlos V'.